

MATERIAL FOR THE STUDY OF SURGERY

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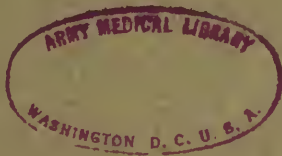
THE
SURGERY OF THE KIDNEY AND ITS
ADNEXA

BEING A SERIES OF CASES SELECTED FOR
CLASS-ROOM STUDY

BY

BAYARD HOLMES, M. D.,

PROFESSOR OF THE PRINCIPLES OF SURGERY IN THE COLLEGE OF PHYSICIANS
AND SURGEONS OF CHICAGO.



CHICAGO

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PREFACE.

The mind grasps with a quick and lasting hold only the concrete and the individual. It would be well, therefore, if the teacher of surgery could call into his lecture room a series of patients suffering from the disease under discussion in all its stages. He would thus be able to present at once the origin, course, treatment and result of treatment of the malady. Another group could be used to illustrate complications, and difficulties. Evidently the largest clinics are too small for more than a beginning on such a plan.

This little compilation is one of a series designed by the author to help the teacher toward the concrete. These histories of cases stand one step removed from the ideal method. Much better cases could, no doubt, be selected. There is a lack of completeness which is unavoidable. The students themselves should bring into class abstracts of other cases taken from the library and from the clinics. Such exercises add to the interest of the study and to the completeness of the presentation.

Such a study of surgery as this little book is designed to encourage will require time and labor on the part of both teacher and student. It will encourage students to obtain a thorough knowledge of medical literature. It will require a closer study of the cases presented in the clinics and it will make the abstract and general statements of the ordinary text-books of surgery more comprehensible.

If this effort adds to the resources of the teachers of surgery in American medical schools and encourages a better pedagogic method, the author will be well pleased.

104 EAST FORTIETH STREET, CHICAGO.

September, 1895.

BAYARD HOLMES.

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THE
SURGERY OF THE KIDNEY AND ITS ADNEXA.

CHAPTER I.

SURGERY OF THE KIDNEY.

BIBLIOGRAPHY.—ANATOMY.—EMBRYOLOGY.—METHODS OF EXAMINING THE KIDNEY.—CONGENITAL MALFORMATION AND MALPOSITION OF THE KIDNEY.—CONGENITAL CYSTIC KIDNEY.—DISPLACED KIDNEY.—INJURIES OF THE KIDNEY.—HYDRO-NEPHROSIS AND CYSTS OF THE KIDNEY IN ADULTS.—TUMORS OF THE KIDNEY.—ABSCESS OF THE KIDNEY AND SUPPURATIVE NEPHRITIS.—CALCULI OF THE KIDNEY.—TUBERCULOSIS OF THE KIDNEY.

BIBLIOGRAPHY.

IN studying the literature of this subject, consult such anatomical works as Quain's Anatomy. Under the embryology of the kidney and ureter will be found references to the periodicals in which certain aspects of the subject are discussed, under the histology of the kidney will be found references to histological studies, and under the gross anatomy other references. When these have been studied, the pathology of the organ should be read in such works as are at hand. In Hamilton's Pathology, for example, will be found references to many important papers on the pathology of the kidney. In the same manner the surgery can be read. Most American and English surgeries make no mention of the literature of the subject treated. Therefore reliance must be placed on the laborious method of studying the literature of each year, beginning with such works as *Sajous' Annual*, *Braithwait's Retrospect* or, what is much better, the *Index Medicus* or *Virchow & Hirsch's Jahresbericht*. It will, of course, be impossible, even when desirable, to find in any library all the literature referred to, but after reading all that can be found, the

separate heads of the thesis brought together, the manner of presentation should be laid out in a synopsis, after which the thesis itself should be written.

ANATOMY OF THE KIDNEY.

General topography; relations to diaphragm, ribs, vertebræ, vena cava, abdominal aorta, quadratus lumborum, psoas, tunica adiposa, the abdominal viscera, the peritoneum; normal movements.

Size and structure, tunica albuginea, connective tissue, muscle tissue, medullary rays and cortical tissue, pyramid, papilla, calyx, infundibula, pelvis, renal artery and vein, the ureter, the hilum.

EMBRYOLOGY OF THE KIDNEYS.

The embryology of the kidney must be studied with that of the other urinary organs and with the embryology of the sexual organs. This is a field in which much remains to be done. A few general and important evolutionary movements have been made out. Some of these are so important that they must always be borne in mind by the operating surgeon; all of them are of the greatest theoretical interest.

The first hint of a urinary and sexual apparatus in the vertebrates is the appearance of the Wolffian duct which begins opposite the heart and connects with the lower end of the intestinal tract. This duct develops from the mesoblast. It is either a canal from the first or a string of epithelium which is hollowed out by the advance of a gland-like space from the cœlum (Leibeshöhle).



In this section of the chick, *represents the beginning of the genito-urinary apparatus.

The pronephros (Vorniere) first develops in all vertebrates as the primary urinary organ and it remains so in the fishes. In other vertebrates it disappears or becomes rudimentary. The Wolffian duct at its upper end is not completely separated from the cœlum but is connected with it by several (3 or 4) nephrotomic tubules. These develop later into long transverse tubules.

Soon after the appearance of the pronephros, there appears on the Wolffian duct a second glandular body, the Wolffian body, or mesonephros. This gland begins with solid rows of cells,

budding off from the *cœlum*. Afterward they become tubular and reach out and unite, by their blind ends, with the Wolffian duct. The result is a long comb-shaped gland, with one tubule for each segment of the body. These segmental canals gradually lengthen and curl up. A tuft of blood vessels comes off from the aorta to each and a Malpighian tuft results. The lower portion of the Wolffian body early disappears by absorption, leaving only the upper portion to develop into a kidney.

METHODS OF EXAMINING THE KIDNEY.

1. Bimanual palpation.
2. Ballotement (Guyon).
3. Respiratory touch, patient on the side.
4. Percussion.
5. Examination of urine.
6. Thermometry.
7. Examination through rectum with the whole hand.
8. Endoscopy of (Simon) the male.
9. Catheterization of ureters (Simon).
10. Catheterization of kidney (Kelley).
11. Puncture of kidney.
12. Exploratory incision.

The examination of the living for the location and size of the kidney can be carried on in the dispensary and on fellow students. It is only by long and careful practice that confidence in diagnosis can be secured. The first four methods can be practiced in succession on every person until the limits of diagnosis have been fixed. Incidentally note which of these and other methods are most useful in the various injuries and diseases of the kidney.

KELLEY, HOWARD, catheterization of the ureters, a monograph.

Many patients can be catheterized without anaesthesia. The buttocks should be brought to the edge of the table, and the legs flexed upon the abdomen. The operator then catheterizes the bladder. This urine is set aside for comparison with that to be obtained from the kidneys. By careful palpation the ureters are located anteriorly through the vaginal wall, noting especially

whether they are well forward under the bladder, or, as often found, abnormally far back in the pelvis.

The bladder is then distended with from 5 to 7 oz. (150-210 c.c.) of the aniline solution. The posterior vaginal wall is retracted with a speculum, exposing the anterior wall up to the cervix, while the bladder is being injected.

The object of this distension of the bladder is two-fold: in the first place it does away with all the rugosities of a contracted bladder, which hinder catheterization, if they do not render it impossible. The only rugosities left are the prominences on either side, through which the mouths of the ureters open into the bladder by a little slit, running obliquely backward in a line with the course of the ureters.

The second reason is well exhibited pictorially by Professor Pawlik, who was the first to demonstrate that the curved folds which cross the anterior vaginal wall out to the lateral walls and around toward the cervix are valuable landmarks in finding the ureters, which lie parallel to and just above them. These are appropriately called the "ureteral folds." They are brought out distinctly by moderate distension of the bladder.

An assistant should determine that the catheter is clear by placing the end in water and blowing through it without touching it with his lips. The metal plug, attached by a short chain to the catheter, is coated with a little vaseline and inserted in the outer end, thus keeping the aniline solution from filling the lumen of the catheter when it enters the bladder.

It is now evident that if clear or straw-colored fluid escapes through the catheter it must be urine, as the deep aniline color of the fluid in the bladder renders deception from that source impossible. When the catheter is introduced as far as the bladder, touch and sight assist in its further introduction into the ureter.

By turning its point forward and elevating the handle, a slight prominence is produced on the anterior vaginal wall. Throughout the manipulations of the catheter this is the constant guide to the vesical orifice of the ureter. The first step after the introduction of the catheter into the bladder is to try to locate the ureteral eminence by the sense of touch communicated from the tip of the catheter.

To this end the movements of the point on the anterior vaginal wall are closely watched as it plays over the base of the bladder. It is made to gently glide in a fore and aft direction from the neck of the bladder to cervix, in the median line, a little to one side, a little further out, and so on until it reaches the ureteral eminence, when it is distinctly felt to trip, jogging the thumb and finger in which the catheter is held.

The same movement is repeated until this point is exactly located. The attempt is now made to introduce the catheter into the ureter by carrying the handle to the opposite side, thus directing the point toward the posterior lateral wall of the pelvis, when the catheter is withdrawn slightly, and with its point still down, but turned a little more toward the side, is swept downward, outward and backward in the direction of the ureteral prominence. With each of these sweeping motions the catheter is rotated until the point is directed fully outward or slightly upward.

This movement, employed in engaging the catheter in the ureter, may very appropriately be called *fishing* for the ureter.

As soon as the catheter enters the ureter its course is fixed, and the tactile sense at once recognizes that it no longer lies free in the bladder as before. If the catheter is released for a moment the handle does not drop, but remains in a fixed position and forms an angle, of about thirty degrees, with a line projected from the urethra. The catheter should be introduced into the ureter until its point reaches the wall of the pelvis, when the plug is removed from the end. A catheter may now be introduced into the opposite ureter and both thus catheterized at the same sitting.

On account of the partial occlusion of the urethra by the first catheter the second is slightly more difficult to introduce.

One of the valuable uses of the urethral catheter is in determining the functional activity and value of both kidneys, as well as the condition of the urine. In one case of tuberculous ureter I drew, as I have stated, acid urine from the right ureter, and alkaline urine from the diseased left side.

I always make the urine drawn the basis of a calculation of

the day's secretion of urine. If it is drawn from but one kidney, it must be remembered that but half the full amount is called for in the calculation. *I leave the catheter in place a definite number of minutes, ten or fifteen, or even thirty, and every drop of urine escaping is caught in a minim or cubic centimetre graduate, and the twenty-four hours urine is calculated from this.* In numerous instances, to my surprise, this has amounted to precisely, or close to, 1500 cc. About half a cc. a minute from each kidney, or one cc. from both, is the normal quantity. That is 60 cc. an hour, or in twenty-four hours $24 \times 60 = 1440$ cc., in the neighborhood of three pints. The urine does not begin to escape from the catheter at once; sometimes it is three or four minutes before beginning. Time must be allowed for it to fill the lumen of the catheter before it begins to run out, and the urine in the catheter must be added to that collected.

The catheter is kept from collecting fluid from the bladder during its introduction into the ureter by coating the metal plug which stops the end with a little vaseline, thus rendering it airtight. As soon as it is in the ureter the plug is withdrawn.

The urine flows by gushes at intervals of ten or fifteen or thirty seconds. It is evident from this that the urine collects in the pelvis of the kidney, passes into the ureter, and is forced down by a peristaltic wave more or less rhythmic in character. It would appear to inspection like a little bolus being swallowed. It is thus forced into the bladder in intermittent jets, as observed in the margins of vesico-vaginal fistula. By this examination I have found one kidney secreting no urine in a case now in my ward, while the other is doing all the work.

BELFIELD, WILLIAM T.—Digital exploration of the kidney with report of three cases. "The Medical Record," N. Y., Vol. 31, p. 537.

A widow, aged twenty-six, has long suffered from dyspepsia; for a year past has been much troubled with headache, pain in loins and left thigh; menstrual intervals were shortened to two or three weeks. In March, 1886, urination became unduly frequent and often painful; pus and sometimes blood appeared in the urine. In June, began to have nausea and vomiting; also disturbances of vision, spots before the eyes, etc. Pain of vary-

ing intensity became constant in back, abdomen, and left thigh ; has been confined to bed ever since.

On admission in October, she is emaciated and very feeble ; requires morphine constantly ; tenderness over both kidneys, especially left ; no swelling nor boggy feeling. Urination every half-hour or oftener, the act accompanied with severe pain at the bladder neck. Urine varied from nine to twenty-seven ounces daily, and contained much blood, pus, and numerous sharp uric-acid crystals, often arranged in rosettes and surrounded with pus-corpuscles. The right ureter was catheterized, and urine found free from pus and blood.

November 29, 1886, the left kidney was exposed by transverse lumbar incision ; to the eye and finger it was normal ; needles passed into the pelvis detected no foreign body. The pelvis was thereupon opened by cautery and explored with the finger ; the mucous membrane was rough and ulcerated, and numerous clots of pus were evacuated. Aside from persistent vomiting for a few days, recovery ensued without notable interruption ; the lumbar fistula was closed on the twenty-first day. The patient has since been free from her former symptoms and is regaining flesh and strength ; the urine is free from pus and blood.

The case presented several interesting features. Though the symptoms—hemorrhages, suppression of urine, and extreme prostration—were such as might be expected from calculi in both kidneys, yet they were increased by aggregations of uric-acid crystals—the largest, smaller than pin-heads, in one pelvis. The menstrual interval was shortened, as the disorder became aggravated, to three, and then two weeks ; after the operative relief they were again lengthened to four weeks.

Especially noteworthy was the direct sequence of the urinary upon the digestive derangement. Several times during convalescence symptoms of indigestion—gastric distress and distention, belching of gas, etc.—occurred, and were invariably followed within a few days by pain over the kidney, irritability of the bladder, and the appearance of sharp uric-acid crystals and some pus in the urine ; with the subsidence of the digestive disturbances the urinary function again became normal.

CONGENITAL MALFORMATION OR MALPOSITION OF THE KIDNEY.

Fetal kidney ; union of two or more kidneys ; accessory kidney ; absence of one kidney ; abnormally placed kidney ; abnormal blood supply ; abnormal pelvis or ureter ; congenital cystic kidney ; errors in supra-renal body.

CHAFFEY, W. C.—Solitary kidney. "Transactions of the Pathological Society of London." Vol. 36, 1885.

In a boy five and a half years old, that died of tuberculosis, the normal left kidney was normally placed, but the right kidney was entirely absent. This kidney was $4\frac{3}{8}$ in. long, $1\frac{5}{8}$ in. broad and weighed $4\frac{3}{8}$ ounces. The ureter had a diameter of $\frac{3}{8}$ of an inch. It traversed the wall of the bladder less obliquely than usual and opened near the middle line by a slit-like aperture.

PRUDDEN, T. MITCHELL.—Congenital absence of left kidney, "N. Y. Medical Record," Vol. 29, p. 314.

The man had died of tuberculosis of the lungs and tubercular meningitis. There had been no renal disease. At the post-mortem, the left supra-renal gland was found in about its normal size and position, but there was no left kidney or ureter or renal artery to go with it. The right kidney was slightly larger than normal.

WOOD, J. W.—Absence of one kidney and carcinoma of the other. "N. Y. Medical Record," Vol. 29, p. 625.

A little girl three months old died after suppression of urine for five days. At the autopsy, the left kidney was absent, and the right was a large mass adherent to the intestines all about and cancerous. It was five inches long. The ureter was seven inches long and greatly dilated.

OLESON, RICHARD B.—A case of horseshoe kidney. "Annals of Surgery," Vol. 20, 1894, p. 731.

The patient, twenty-six years old, died of pneumonia. The kidney lay with two upper extremities in the usual situation of the kidneys. The lower ends of the normally placed kidneys were united to each other by two other apparently normal kidneys with their hiluses turned upward. The ends of these two accessory kidneys were melted together and to the lower ends of the normally placed kidneys. The arteries, veins and ureters of these four kidneys seemed perfectly normal.

In 507 autopsies at the County hospital, three cases of malposition of the kidney were observed and this single case of congenital anomaly.

STRUBE, GEORG.—Ueber congenitale Lage- und Bildungs-anomalien der Nieren. "Archiv für pathologische Anatomie und Physiologie und für klinische Medicin," 137, p. 227.

The most frequent of the anomalies of the kidney is the absence of one or the other kidney. This was noticed by Aristotle. During the last four hundred years a great many cases of various anomalies of the kidneys have been noticed. Some of them are of interest to the investigator, while others are of practical interest to the physician and operating surgeon. Strube reports four cases.

The first one was a normal right kidney, with the left kidney displaced downward. It was observed in a child twenty-seven days old. The right kidney and the supra-renal capsule lay in their normal positions. The left kidney was found upon the left side deep in the pelvis over the last lumbar vertebra and at the bifurcation of the aorta and in the right iliac fossa. The ovaries lay upon either side of the lower end of the left kidney, which was a little longer and a little wider than the right. The pelvis of the left kidney was double, one pelvis going out from the lower end and one from the upper end of the kidney, with two ureters that joined each other soon and emptied into the normal bladder. The left kidney was supplied with three arteries. Two of these came directly from the right side of the bifurcation of the aorta, the other arose two centimeters above. All three entered the dorsal part of the kidney and renal vein, passed out of the ventricle side of the kidney and ran behind the aorta, where it joined the left supra-renal vein and emptied into the inferior vena cava. The right kidney was supplied with two veins. The upper one was normally located; the other one arose from the upper left renal artery.

The second case was one of absence of the left kidney and displacement downward of the right kidney, with atresia ani vesicalis. This was a male child four weeks old, with complete absence of the rectum. There was marked phimosis and the fecal matter passed out of the urethra with the urine. The ab-

domen when examined was tympanitic. An operation was undertaken, but the child soon died, and at the post-mortem neither kidney could be found in its normal place. The two supra-renal capsules were, however, found as round masses on both sides of the vertebræ in their normal places. The only kidney to be found lay deep in the pelvis and was large and horseshoe-shaped and almost directly over the bifurcation of the aorta. This kidney had four calices and they emptied into two ureters, each about 2-1-2 centimeters long. The kidney was supplied by blood through three arteries; one came from the right and two from the left side. They arose just above the bifurcation of the aorta upon the right side, while those on the left side arose over the common iliac.

The third case presented an absence of the right kidney with the left kidney in the pelvis. It was in a patient thirty-two years old, who died of an acute nephritis due to laparotomy, undertaken to remove a tumor, which proved to be the movable kidney. Both supra-renal capsules were found of their normal sizes and in their normal places, with a normal blood supply. The only kidney present lay between the fourth lumbar vertebra and the second vertebra of the sacrum. It was twelve centimeters long, eight centimeters wide and four and one-half centimeters thick. It lay in the pelvis especially toward the left side, so that it covered the left iliac vessels. Its highest point was at the bifurcation of the aorta; its lowest point rested deep in the pelvis. The kidney was lobulated. The pelvis of the kidney was made up of four calices, two of them small and two of them large. The ureter was eleven centimeters long and very much dilated. It passed behind the rectum on the left side of the vertebra into the bladder. On the right side of the kidney was a piece of tissue four centimeters long by two or three centimeters wide. It showed upon microscopical examination to contain a few glomerules with a colloid mass. From this passed a cord, evidently an obliterated ureter, toward the bladder, about its normal position. The kidney was supplied by two arteries and two veins. The supra-renal artery arose one and one-half centimeters from the bifurcation of the aorta and entered the right upper part of the kidney and distributed itself by means of

two branches. The lower renal artery arose from the left hypogastric and passed directly into the hilum. The renal vein emptied into the left common iliac vein.

The fourth case was a horseshoe kidney found in a man seventy-nine years old. The left kidney lay in its accustomed place and at its lower end it was joined to the right kidney, which lay in the left iliac fossa. The left kidney was of singular size and shape. Its hilum lay upon the inner side of the organ. The left ureter lay in front of the double organ in a furrow, which extended from both kidneys. The whole organ was seventeen centimeters long, of which ten centimeters was the left kidney; the right kidney was smaller, being about six centimeters long and five centimeters wide. The posterior part of both kidneys was smooth. The several small urinary branches passed out of the kidney directly into the ureter; from the left there were five such canals; from the right, six. The right ureter crossed the os sacrum and into the posterior wall of the bladder where it opened; the bladder maintained normal relations. The left renal artery arose normally from the aorta. The right renal artery arose about two and one-half centimeters from the bifurcation of the aorta. It divided into two branches and entered the front surface of the kidney directly into the perianchyma. The lower right renal artery arose from the ureter and entered the dorsal side of the kidney. The left renal vein entered into the vena cava. The two right renal veins followed the course of the renal arteries and emptied into the iliac vein at its junction with the vena cava.

Grubber, in 1866, collected thirty-six cases of malformation or congenital displacement of the kidney and since that time eleven other cases have been reported, making forty-eight cases available. Of these, sixteen are cases of displacement of the kidney downward. The most common defect is absence of one kidney and the presence of the other in its normal position. The displacement of the single kidney is rare. Wisbach, Watson and Strube each report one case.

The most frequent anomaly is probably the horseshoe kidney. Stocquart describes such a case, and collected a large number from the old literature. Thirty-three cases are available

for study now. The division of the kidney into various parts is occasionally observed, that is, normal foetal kidney arrested in its tendency to conglomerate. The anomalies of the kidney relate not only to form and size and blood supply, but also to position.

A very full account of the literature of anomalies of the kidney may be found at the end of Strube's article. See also the pathologies of Orth, Klebs, Ziegler and Hamilton.

CONGENITAL CYSTS OF THE KIDNEY.

Congenital cysts of the kidney seem to be related in some way with other errors of development, so that only a few such children survive to come to surgical treatment. The blood supply of the cystic kidney is usually very small. The ureter remains patent. Sometimes only a part of the kidney is cystic. The cysts are sometimes so large as to interfere with labor, and after labor the tumor presses against the diaphragm and makes respiration difficult or practically impossible. Many of these children live a few days or even weeks and then die of exhaustion. Sometimes the cystic kidney is unrecognized; the child lives; the remaining kidney hypertrophies.



Congenital cystic kidney of a new-born child. $\frac{2}{3}$ natural size. Orth.

SUTTON, J. BLAND.—Tumors, innocent and malignant. Philadelphia, 1893, p. 253.

Sutton copies a sketch from H. Morris which is reduced and presented here. It represents a congenital cystic kidney. Some of the cortical substance is left between the cysts. In typical cases like this, the kidney is converted into cystic masses so that on section the appearance of a sponge is presented. The cysts vary greatly in size. Some of these project from the surface of the kidney. In early stages they have a covering of epithelium which is difficult to find in advanced



cases. Sometimes the renal pelvis is easily recognized, but later it becomes filled with fatty matter. The ureter is usually extremely narrow, but always pervious throughout. The blood supply in the cystic kidney is always very small. Congenitally cystic kidneys sometimes attain an enormous size, so large indeed as to seriously impede labor, and necessitate the destruction of the foetus to enable delivery to be effected. Other congenital defects are usually associated with cystic kidney.

DISPLACED KIDNEY.

Dislocation of the kidney; wandering kidney; congenital disposition to wandering kidney; acquired; frequency; right; left; symptoms; course; complications; hydronephrosis, pyonephrosis; obstruction of bowels; hernia; fixation of wandering kidney; indications; treatment; nephrectomy; suture of kidney; accidents in treatment.

Wandering kidney, relative obstruction of the colon; operation; recovery.

This case was a woman sixty-two years old. She had suffered from a severe pain in the region of the gall bladder soon after each meal, and at other intervals for years. Relief from pain was only to be secured by the reclining posture and then only after some time. A slightly movable tumor could be felt a little farther to the right than the gall bladder. This tumor was hard, painful and about the size of the fist. It could be moved only about an inch in any direction, and, downward, not at all. The area of lateral dullness in the back was less on the right than on the left side. The left kidney could be demonstrated by palpation, but on account of the pain, the right side could not be examined. The patient's temperature, pulse and health seemed normal. On opening the abdomen, the gall bladder was found normal; the tumor lay directly against it and was quite firmly attached to the mesentery of the small intestines. These adhesions were carefully loosened up and the tumor found to be the pulsating kidney. This organ was then raised up and pulled off from the ascending colon, over which its pedicle lay. It was then pushed back into its place in the back and fastened with cat-gut sutures. The colon was fastened up to the lateral abdominal wall. The patient recovered and became a well, strong woman, able to walk and ride. She had no return of the symptoms.

LAMDAU, LEOPOLD.—Movable kidney in women. "The New Sydenham Society," Vol. 110, p. 227.

1. *Movable kidney on the right side, violent gastric pain.*

A man, thirty-two years old, had been troubled with a painful tumor in the right hypochondriac and umbilical regions which drove him to the use of harmful remedies. This tumor was movable about a center in the right side of the abdomen but most movable in the morning in a peculiar position in bed. No diagnosis was made and the man died of consumption with apoplectic symptoms. At the autopsy, beside the tubercular lungs the right kidney was found to be very movable. It could be displaced into the pelvis. It was surrounded by a capsule destitute of fat.

2. *Movable kidney on the right side. Remarkable displacement of the large and small intestines.*

The right kidney of a woman, sixty-six years old, was found loosely movable about the abdomen without any surrounding of fat. The cæcum seemed to pass directly into a transverse colon which ran down to the pelvis and then upward toward the spleen, and then downward as a descending colon.

3. *Movable kidney on the right side, compression of the vena cava, thrombosis of the vena cava, œdema of the right lower extremity.*

A woman who gave a history of violent coughing for years had been troubled for some months with abdominal pain after violent coughing, and during the last month before death the right leg had been greatly swollen.

On post-mortem, besides the chest findings of tuberculosis, the right leg was found twice the size of the other. The right kidney was enveloped in peritoneum, except at the hilum, where it formed a meso-nephron two inches long. This kidney was movable to the third lumbar vertebra, and the inner side of the ascending colon. Where the kidney lay on the vena cava this vein was contracted and below this point dilated to double its normal size and filled with a cavernous thrombus.

4. *Movable kidney on the right side; neuralgia of the leg; death from entro-colitis and peritonitis.*

This woman had worked for many years in a tobacco factory.

She was fifty-one years old. Ever since a fall she had suffered from severe pain in the right loin and labium majus. Nothing but rest on the back relieved this pain. Bimanual examination readily detected the movable right kidney. Pressure upon it produced pain radiating to the right knee. She soon developed peritonitis and died. The post-mortem showed besides the cause of death, that the greatly enlarged liver had displaced the right kidney which was loosely movable in the abdomen, its lower end extending downward and ventralward against the abdominal wall. This kidney was small, 80 grm. while the left normally placed kidney was large, 150 grm. The right suprarenal body was found in its normal position.

5. *Double movable kidney.*

In a consumptive woman both movable kidneys were easily felt through the abdominal wall. At the autopsy the right kidney was found lying loose, one and a half inches below the liver, and attached only by its vessels and ureter; it was entirely destitute of fat. The left kidney lay an inch lower than normal.

6. *Movable kidney on the right side; hydronephrosis.*

In a woman fifty years old, suffering from carcinoma of the uterus, a large tumor in the right side of the abdomen was found to be the degenerated and distended kidney, movable and connected with a greatly distended ureter.

7. *Movable kidney on the right side, adhesions between it and the liver, gall bladder and transverse colon, hydronephrosis, etc., etc.*

8. *Movable kidney on the left side, neuralgia of the leg, hydronephrosis mistaken for an ovarian tumor.*

9. *Movable kidney on the left side, with extreme mobility, displacement of the colon.*

10. *Movable kidney on the right side, adhesions to the liver.*

11 and 12. *Movable kidneys on the right side.*

13. *Movable kidney on the right side.*

14. *Movable kidney on the right side.*

In a woman who had lost much flesh from obstinate vomiting, a movable kidney was discovered on the right side. Pressure against its lower end made it slip away from the hand

upward, and the upper end could be pressed to right or left. Pressure on the upper end drove the tumor plainly, but only a little, downward. If seized with the whole hand it could be pushed upward, but the hilum could not be reached. If pressed downward, it was so smooth that it slipped away.

At the autopsy the kidney could be displaced from the loin to the extent of two inches above and three inches below, this mobility not being restrained by the vessels. The peritoneum was adherent to the whole anterior surface of the kidney and to part of its lateral and posterior surfaces, but did not enclose the emerging vessels so as to form a mesentery (mesonephoron). The peritoneum passed somewhat loosely from the kidney to the adjacent organs in the loin.

INJURIES OF THE KIDNEY.

Subcutaneous injuries of the kidney opening the blood vessels into the urinary tract; into the perinephritic tissue; into the peritoneal cavity; opening the urinary tract; into the perinephritic tissue; into the peritoneum; obstructing the blood supply; obstructing the urinary flow; precipitating arrest of function in the other kidney; localizing infection.

Open wounds of the kidney, same considerations as above.

Diagnosis, course, prognosis, indications for treatment.

Shall the injured kidney ever be removed? When?

What shall be the treatment of subcutaneous rupture of the kidney into the urinary tract? immediate? on the third day?

HOLMES, T.—“A System of Surgery.” 2d edition. New York. 1870. II, p. 651.

A gentleman was bruised over the left loin by a fall in hunting, and experienced severe pain in the back on arriving home. He was very judiciously treated for some weeks after the accident, and came under the notice of the author some months subsequently. The bladder was now very irritable; and highly offensive urine, mixed with pus, was constantly passed. There was every evidence of abscess of the kidney; the quantity of pus was sometimes very considerable. The health became gradually deteriorated, and death occurred about two years subsequent to the accident.

The left kidney was entirely destroyed; and in its situation was found a large irregular abscess, with its walls adherent to

the surrounding soft tissues, and its cavity continuous with the ureter.

A boy was struck, over and rather in front of the right lumbar region, by the handle of a truck, in consequence of the truck coming in collision with a wagon. From the violence of the blow, the boy was forced against a post of a gateway. He immediately fell, and though able to rise and walk a few steps, he again fell, and was then carried to Guy's Hospital. He was in a state of extreme collapse, with some pain in the abdomen. He died within a hour and a half of the accident.

Externally there was slight ecchymosis over the extremities of the seventh and eighth ribs on the right, and the last two ribs on the left side. The cavity of the peritoneum contained a large quantity of coagulated and fluid blood. All that portion of the left kidney above the entrance of its vessels was torn from the lower portion, and was separated from the natural surrounding attachments. The lower portion was not disturbed in its position. There was some ecchymosis on the surface of the liver opposite to that on the chest.

Rupture of left renal vein.

A man was working on a tall building; the scaffolding was perforated by a small elevator opening, in which a steam elevator platform was at the moment standing. He stepped upon this platform and signaled to go down. The elevator was evidently out of order, for it fell with great velocity eleven stories, and precipitated the workman upon a pile of rubbish on the street. This rubbish of laths, shavings and small pieces of board, broke the fall very much. The man was immediately picked up and carried to a hospital across the street, where he soon recovered consciousness. There he lay in bed all night under protest. There was no indication of any injury. The urine was bloodless. The symptoms of hemorrhage were not present. In the morning he was taken to his home. On the following evening he went into collapse and died. Postmortem examination showed no injury except a ruptured left renal vein with interstitial hemorrhage.

BRIDGON, CHAS. K.—Cases of ruptured kidney. "Annals of Surgery," vol. 19, 1894.

A man, 43 years old, was observed in hospital eleven days after a fall from a scaffold sixteen feet from the ground. He had had sharp pains in the left side and passed bloody urine at intervals. On admission his temperature was 101° F.; the urine contained considerable blood. There was a fullness and sense of resistance over the left lumbar region. Patient complained of great tenderness here. The countenance was pale and sallow, the body emaciated. The tumor and all symptoms increased for 13 days, when a lumbar incision was made down to the kidney. The blood, urine and pus were found in the perinephritic tissues. A rent was found in the capsule of the kidney. This capsule was raised up for a considerable distance with clots of blood. Drainage was instituted and a good recovery made in about six weeks.

A laborer was admitted to the hospital two weeks after an injury received by falling into a sewer hole. He had been at work all the time. He had had some pain and the urine had been dark-colored. Urination had been painful. He had very severe pain in the right hypochondrium the day before admission to the hospital.

His temperature on admission was 100½° F., respiration 20, and pulse 88. There was so much blood in the urine that it solidified soon after passing. Incision was made over the tumor and a transverse rent found in the right kidney. The wound was tamponed. The urine discharged through it for a month, when it closed. No calculi have since been observed in this case.

A sixteen-year-old boy was knocked down in the street by a wagon. A wheel passed over his body. He jumped up and ran on his way, when in a few minutes he felt an urgent desire to urinate. At first clear urine came away and then almost pure blood. He went home and to bed, and passed bloody urine and vomited for a few hours, when he was taken to the hospital. A mass was detected in the left costo-iliac space. His temperature was 99, pulse 72, and respiration 22. The urine was full of blood. He was carefully watched, kept in bed and recovered without operation.

Gunshot wound of the kidney, liver and pericardium.

Dr. T. J. Sullivan called me to see a boy who had been shot in the back while standing, by the discharge of a 22-calibre revolver that fell from his hip pocket in a scuffle. The accident happened five hours previously. Shock and collapse had gradually increased. The pulse was rapid and almost imperceptible. Urine had been passed highly colored and mixed with blood. A small, almost bloodless wound was found two and a quarter inches from the spine and between the tenth and eleventh right ribs. A bullet could be felt just under the skin and exactly at the apex of the heart. The abdomen was distended. The tympany of the stomach pressed downward. Flatness over the loins was greatly increased in both directions and the area of cardiac dullness was increased. All the indications were those of wound of the kidney and intra-peritoneal hemorrhage.

The abdomen was opened by a long median incision. No blood was found in the peritoneal cavity. On lifting up the right abdominal wall, the finger could be passed over the surface of the left lobe of the liver to a hole which was easily closed with a few sutures. When the stomach was raised up dark blood poured in an enormous stream from the foramen of Winslow. The little peritoneum was found full of blood. A hole in the under surface of the liver was closed with an iodoform gauze tampon. An incision was made along the track of the bullet to the kidney. The eleventh and twelfth ribs were resected by the way, the pleura closed and united to the diaphragm, and the wound in the kidney washed out and tamponed with iodoform gauze, a drainage tube being in the middle of the gauze leading down to the pelvis of the kidney. The bullet was removed from the precordium and all the wounds closed. The patient made an uninterrupted recovery, although the operation was performed in a dirty kitchen in the rear of a saloon. The renal sinus remained open about six weeks. No evidence of renal calculus has since appeared.

TIFFANY, LOUIS McLANE.—Gun-shot wound of the spleen and kidney; abdominal section; hemostasis by deep suture; recovery. "*Medical News*," Phila., Nov. 17, 1894.

The patient was a male negro, twenty years of age. Two

hours previous to entering the hospital he had been shot with a small-caliber rifle from a distance of twenty feet, the weapon being directly behind him and he being erect. When admitted his urine was slightly albuminous; the pulse, temperature, and respiration normal. There was a bullet-wound three inches to the left of the spine just below the last rib, from which blood oozed. The resident physician, after proper cleansing, enlarged the wound, found that the kidney had been injured and that the bullet had passed onward, presumptively into the peritoneal cavity; he filled the wound lightly with gauze and notified me. I saw the patient three hours later, about five hours after the shooting. The only change that had taken place since entry into the hospital was an increase of five per minute in the number of respirations; the pulse and temperature were not changed, and there was no appearance of shock and no pain. External examination of the abdomen by touch and palpation revealed nothing, not even painfulness.

The patient was anesthetized, laid on the belly, and the wound, after being enlarged, was examined. The upper portion of the left kidney was perforated, and dark blood flowed from the peritoneal cavity beyond. This large wound was filled with gauze, the patient turned on the back, and the abdomen freely opened along the left semi-lunar line. A moderate amount of blood was free in the peritoneal cavity; no wound of the intestine could be discovered, but the spleen was found perforated, blood flowing freely from the wound of entrance, as well as from the wound of exit; the latter wound, in the concavity of the organ, was slightly the larger of the two.

The perforation through the spleen was about three inches from the free lower border. Unwilling to subject the patient to splenectomy, I attempted to arrest the bleeding in the following manner: A long needle threaded with silk was passed entirely through the spleen, central to and parallel with the bullet-track; the long ligature was then tied over the free border of the organ so as to press the surfaces of the wound together tightly enough to arrest bleeding, yet not to tear through the splenic tissue; the ends of the ligature were cut short, the peritoneal cavity cleansed by copious irrigation with hot water and the abdominal wound

closed. The kidney was tamponed with gauze through the dorsal wound. Convalescence was uneventful; the anterior wound healed by primary union; urine flowed from the dorsal wound for two days only, union by granulation taking place. The patient left the hospital well, April 2d.

ALDIBERT.—Surgery of the kidney in children. "*Revue Mensuelle des Maladies de l'Enfance*," tome XI., 1893.

This is a careful study of the surgical affections of the kidney in children. But three cases of wounds of the kidney are cited. In each instance the kidney was excised and the cases recovered. In considering contusions and lacerations of the kidney the author holds that in the latter form of injury there is in children more frequently than in adults a corresponding tear in the peritoneum, thus allowing of an abundant intraperitoneal exudation of blood. From this it follows that hemorrhage is liable to be freer and there is less chance of its spontaneous cessation.

In the treatment of these cases the transperitoneal route should be chosen, since thus only can the toilet of the peritoneal cavity be made. The indications during the hemorrhagic period are to search for the source of bleeding if the hemorrhage is continuous and severe, and to free the bladder of clots if these cause retention. The checking of hemorrhage is sometimes extremely difficult. Thus, in nine cases of death, seven perished within eleven hours of the time of injury, almost too soon for intervention. The two children who lived thirty-six and sixty hours might have been operated upon, but in them the hamaturia was very slight, and the intraperitoneal bleeding was the cause of death. It is extremely difficult at first to differentiate the symptoms of shock from those of hemorrhage. Wier's case is cited. Twenty hours after injury symptoms of hemorrhage were pronounced; laparotomy was performed, and the kidney, dislocated into the abdominal cavity and lying near the iliac crest, was removed. Hemorrhage persisted, and was found to come from a ruptured spleen, which was in turn extirpated. This child perished.

The bladder should be emptied of clots by aseptic aspiration, or, when this is not successful, possibly by hypogastric section.

Following the hemorrhagic period, after contusion or rupture of the kidney, there is liable to occur renal or perirenal suppuration.

Rupture of kidney in a child; recovery without treatment.

I was called to see a boy seven years old who had fallen twenty-four hours before on a wagon tongue from the dash board three feet above it. The child was comatose, could not be roused. The pupils were contracted (no morphine had been used) and the reactions very sluggish. The boy had been picked up unconscious but he soon came to himself and complained of great pain in the left side and abdomen. Ten minutes later he passed a large amount of almost pure blood in trying to urinate. Bloody urine continued up to the last urination which was clear, no "black worm" (blood clot) had been passed. The boy was frequently taken with severe paroxysms of pain. They were most severe just before urination, and were frequently accompanied by vomiting. On examining the body, no bruise or extravasation could be found. There was a large area of dullness in the left flank behind on the side, and as far as the outer border of the rectus muscle in front. I recommended operation on the following morning, but upon arriving with nurse and material, the boy was so much better that the operation was delayed. The improvement continued and recovery took place.

HYDRONEPHROSIS AND CYSTS OF THE KIDNEY IN THE ADULT.

Retention cysts of the kidney due to obstruction in the urinary tubules; to obstruction in ureter; to obstruction in urethra. Cysts due to parasites; to disorganized tumors; and in cystic forms of carcinoma and sarcoma.

Clinical forms of obstruction; stricture, compression, torsion. Clinical features, constant, intermittent retention; diagnosis, course, termination, treatment of the various forms.

SUTTON, J. BLAND.—Tumors innocent and malignant.
Philadelphia, 1893, p. 397.

This is a sketch of a hydronephrosis due to a large calculus filling the bladder with two small pieces in the prostate. Both kidneys and ureters were in the same condition. The patient was a man twenty-six years old. He died with complete sup-



pression of urine. The pelvis is gradually dilated, inducing atrophy of the renal tissue until it is converted into a multilocular cyst.

DUNNING, L. H.—Nephrectomy, report of four cases, etc. Transactions of the American Association of Obstetricians and Gynecologists. Vol. 7., 1894, p. 340.

Hydronephrosis of several months duration, diagnosticated ovarian tumor. Tumor removed by abdominal section. Recovery of patient. The hydronephrosis due to impermeable stricture of the ureter, one and one-half inches long.

Mrs. K., age about fifty-five years, was referred to me by Dr. Drake, of Shelbyville, Indiana. The tumor, which had been first discovered five or six months previously, had been steadily growing, until at the time of my observation it occupied the space between the crest of the ilium and the short ribs upon the right side. The inner border reached the median line. It had but a limited range of motion, which I attributed to adhesions. My belief was that the patient had had a moderate degree of peritonitis, causing adhesion of the ovarian cyst wall to the parietal peritoneum. A few months previously to this I had removed an ovarian tumor so similar in size, location, and other features, that I did not give due weight to the information the physical signs yielded me; for instance, there was resonance over a limited portion of the superior anterior surface of the tumor. Furthermore, I could not ascertain from the patient the fact that the tumor grew from above downward, and there were no symptoms pointing to disease of kidney or bladder. The operation was done January 30, 1893, at my private hospital. A central abdominal incision was made. The tumor was found retro-peritoneal. I determined to remove the tumor, even though the hydronephrosis were due to an impacted stone in the ureter. It was tapped and two quarts of dark-colored fluid withdrawn. The perinephritic tissue was quite firmly adherent. The ureter was not seen. The renal vessels were tied and cut between the ligature and tumor, and the tumor enucleated. The cortical portion of the kidney was thin, and formed one-quarter to one-eighth of the cyst wall. The remainder of the cyst wall was the dilated pelvis of the kidney and upper portion of the ureter.

Upon examination of the mass removed we found remnants of the ureter hanging by the cyst wall. It was cord like, and one and one-half inches long and entirely impervious. This would account for the persistent and steady, though slow, growth of the tumor. No stitches were taken in the posterior layer of the peritoneum. The abdominal incision was closed in the usual manner and drainage employed. The recovery of the patient was rapid, nothing occurring to interrupt it. The cause of the stricture in the case was not determined. No stone was found, and no disease of the kidney. The cortical portion was simply atrophied by pressure. The woman was fifty-five years of age, and had enjoyed good health until one year previously. The stricture of the ureter was probably acquired by inflammation or ulceration.

WHITE, W. H.—Great dilatation of one ureter and pelvis of the kidney secondary to stricture of the urethra. "Transactions of the Pathological Society of London." Vol. 38, p. 168.

A man, forty years old, died three days after admission to hospital. He had a tight stricture of the urethra and hypertrophied and distended bladder. On post-mortem the stricture of the urethra was found, the left ureter was dilated right down to the bladder to such a size that it would admit the middle finger. The pelvis of the left kidney was much dilated and the greater part of the pyramids had disappeared.

SUTTON, J. BLAND.—Tumors innocent and malignant. Philadelphia, 1893, p. 383.

When a hydronephrotic kidney is of large size it can be perceived clinically as a definite tumor. Sometimes patients come under observation with a tumor that can be found at one time but not at another. This diminution or disappearance of the tumor is sometimes coincident with unusually large discharge of urine. Such a clinical history is not sufficient to diagnose a hydro-supphrosis, as paravarian cysts have been known to rupture into the abdomen and then the fluid become quickly absorbed and excreted by the kidneys. The accompanying figure represents an intermittent hydronephrotic kidney.



Cystic Kidney of the Adult.

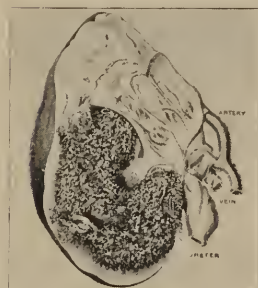
This is generally a disease of advanced life. A few cases have been observed in which the cysts were eight or ten inches in diameter but they are usually only a half-inch or so in diameter and of no surgical importance. Occasionally multiple cyst formation in the kidney and liver has been observed. In such cases the cysts were usually small. Most cysts of the kidney contain a urinous fluid, sometimes mixed with blood or degenerated blood, cholesterin, fat, various coloring matters and even calculi.

TUMORS OF THE KIDNEY.

Benign and malignant; age of patients; source of new growth; infectious tumors, neoplasms; epithelial, connective tissue; embryonal, mature; myoma, lipoma, cystoma, adenoma, epithelioma, sarcoma. Statistics; frequency; primary, secondary; metastatic extension. Relation to injury and calculi; sex; social condition; infectious diseases.

MURCHISON, C.—Case of villous disease of the bladder and kidneys. "Transactions of the Pathological Society of London." Vol. 21, p. 241.

This patient was sixty-five years old; he had been well until recently. For two or three years he had occasional attacks of increasing frequency of micturition. He first noticed blood a year before coming to the hospital. After this first hematuria there was no show of blood for two or three months. After six months the hematuria appeared every ten or fourteen days. For a few months it had been constant.



At the commencement of his illness the urine first passed was only slightly tinged with blood, while the last was almost pure blood. As the amount of blood increased, the patient suffered obstruction from the impaction of clots in the urethra. There was no other pain, no renal colic. The urine was free from pus. The man died of hemorrhage. At the autopsy papilloma of the bladder and right kidney was found.

WAGNER, PAUL.—Casuistische Beiträge zur Nierenchirurgie. "Deutsche Zeitschrift für Chirurgie." Vol. 24, p. 505.

A patient, forty-eight years old, with a good history, suddenly and without injury or other apparent cause passed without pain a large amount of blood in the urine. This hematuria continued three days the first time and appeared at intervals for sometimes a half-day and at other times for longer periods up to six days. During the remaining seven years of his life, at times the urine was slightly tinged, at other times it was almost pure blood. Frequently at the end of these hemorrhages he passed a worm-like clot of blood 8-12 centimeters long with a distinct cast of the pelvis of the kidney at one end. The patient had pain in both renal regions and frequently tenesmus of the bladder in passing blood. Sometimes the pain was more severe on one side and sometimes on the other. At last five years after the beginning of the disease, when the patient had become very anemic, a tumor was recognized in the left side. It appeared to be a slow-growing, solid mass. There appeared difficulty of digestion, diarrhea and later pleuritic pains in the left thorax and a troublesome cough. Twice there was pulmonary hemorrhage. The temperature was that of an intermittent fever. Three months before his death, of marasmus, edema of the lower extremities set in. At the post-mortem, a spindle-celled sarcoma of the left kidney was discovered with metastatic masses in both lungs and pleuræ, in several ribs, and in the right humerus. The sarcoma of the kidney was 15-13 centimeters in diameter.

MACKIE, WILLIAM.—Renal neoplasms, with report of two cases of nephrectomy. "Medical News," Phila., Aug. 5, 1893.

A female, 22 years of age, was admitted to the hospital August 23, 1890, with a diagnosis of renal tumor, probably a sarcoma. For about two years she had suffered from dragging pains in the right lumbar region, with periods of paroxysmal exacerbation, pain in the epigastrium and vomiting. During such an attack everything was rejected by the stomach for three or four days. They recurred at shorter and shorter intervals. Five months ago she fell and attention was attracted to the lumbar region, where a tumor was discovered. This tumor had

gradually increased in size, and with the increase there were more frequent attacks of pain in the epigastric region, and accompanying vomiting. There is no history of urinary disturbance beyond increased frequency of micturition prior to menstruation, which has always been regular, but during the past six months of diminishing quantity.

The patient is anemic, but fairly nourished; she has lost in past years about eight pounds in weight. Inspection reveals a fullness in the right lumbar and umbilical regions, and on palpation, an oblong tumor, extending from the right renal region posteriorly to a point beyond the middle line and below the umbilicus, can be made out. The lower end of the tumor is rounded and smooth; the upper, under cover of the costal arches, is larger and nodular. The tumor is freely movable and can be separated from the liver on the right side. It gives an indistinct feeling of fluctuation. On percussion, dullness is found to extend from the middle line just below the umbilicus, backward to the lumbar region, continuous with the liver-dullness, laterally and posteriorly, separated from it anteriorly at a point midway between the middle line and the costal arch. Rectal insufflation of air diminished this area of dullness anteriorly, and thus demonstrated the retroperitoneal location of the tumor. For ten days prior to the operation the urine varied in quantity from 16 to 32 ounces daily, was of a specific gravity of 1020, contained a trace of albumin, and numerous small decolorized blood-corpuscles and bladder-epithelia.

The operation was performed September 3, 1890. On account of the large size and great mobility of the tumor, the abdomen was opened in the middle line. The left kidney was found to be apparently healthy, but enlarged, the ascending colon displaced inward, and the new growth in contact with the abdominal wall anteriorly. The ascending colon was now dragged as far as possible toward the median line, a small slit made in the peritoneum to its outer side, and through this the tumor was gradually enucleated by the finger. During enucleation numerous large vessels in the perirenal fat required ligation. The ureter was first ligated low down and cut through. On ligating the vessels the patient suddenly ceased breathing, but rallied

soon under artificial respiration and stimulants hypodermatically. After section, the renal vein was found to contain partially coagulated blood. The pedicle was dropped back, the rent in the peritoneum left unsutured, no drainage provided, and the abdomen closed. For the first three days following the operation the patient suffered from one of her usual attacks of colic, epigastric pain, vomiting, etc. Beyond this, recovery was uneventful.

The tumor as removed weighed eleven pounds, was covered throughout by large veins, firm and smooth at the lower pole, semi-fluctuating and nodular at the upper. On section, the upper part was found made up of cavities of varying size, filled with dark sanguineous fluid, or partially coagulated blood. No kidney-substance remained. The lower or solid part contained considerable kidney-substance, and, in the center, a fatty tumor undergoing degeneration. Microscopic examination showed it to be a round-celled sarcoma.

Subsequently the patient considered herself well for about six months, when she had an attack of influenza. Persistent cough followed this, and later her old attacks of colic reappeared. She was readmitted into the hospital July 1, 1891, when examination revealed a recurrence of the disease in the pedicle; also a small nodule of the same character at the lower angle of the abdominal incision, and numerous crepitant râles throughout the whole chest. She died September 1, 1891. At the necropsy the condition as stated was found, and in both lungs multiple and disseminated secondary growths in all stages of degeneration. The left kidney was one-third larger than normal; the other organs were healthy.

Papilloma of the Right Kidney; Nephrectomy.

A. S. (first seen in consultation with Dr. Lang, November 28, 1892), twenty-six years of age, the mother of two children, the youngest one and a half years old; dates her trouble back to her last pregnancy. During the period of gestation she had occasional uncomfortable sensations in the right lumbar region. After her confinement these disappeared, only to recur early in the summer of 1891. In August, 1892, she first detected, under the right costal margin, a tumor, which was diagnosticated by

Dr. Lang as a floating kidney. As the kidney was not very movable, he directed that a snug bandage should be used. This gave temporary relief. Still the tumor steadily increased, and became more movable. About the same time, and two days prior to her menstrual period, she had an attack somewhat resembling renal colic, with hematuria. These attacks have recurred regularly at this time since. In the interval urine is always free from blood. The patient is certain that there is no variation in the size of the tumor, or in the discharge of urine, during these attacks. Menstruation is regular. The woman was always healthy. One brother died of sarcoma of the thigh.

The patient was very anemic, having had a very severe attack of hematuria November 28, 1892, the urine appearing as if pure blood, and being of a deep smoky tinge. Examination of the abdomen showed a tumor to the right of the middle line and on a level with the umbilicus. It was freely movable in an antero-posterior direction. In size it was three times as large as a normal kidney, thickened from before backward; the pelvis and both poles could be made out. On December 1st she was admitted into the Milwaukee Hospital, when it was found that rest in bed had no influence on the character of the urine. On the 4th she began to menstruate, after which there was less blood in the urine. The daily average of urine voided for nine days was 43 ounces, the maximum being 56 ounces, and the minimum 36. The probable diagnosis was sarcoma.

Operation was undertaken December 10, 1892, under chloroform-anesthesia. The kidney was exposed by König's incision. Exploratory puncture with a hollow needle failed to reveal anything. The needle was followed by ignipuncture, with the Paquelin cautery, and digital exploration of the interior of the kidney. The exploring finger detected soft, broken-down tissue, surrounded by an apparently firm wall. This opening was tamponed with iodoform-gauze, an additional forward transverse incision made in the soft parts, and the kidney removed. The incision was closed by deep sutures of catgut and superficial ones of silk. On the first day following the operation, 21 ounces of urine were voided; on the second, 32; on the third, 29; on the fourth, 35; and thereafter the quantity ranged from 32 to 36

ounces. Primary union of the incision occurred. The patient was kept in the recumbent position for four weeks to insure firm union of the incision, and thus guard against the occurrence of a ventral hernia. Rapid improvement of the general health followed and has continued.

The kidney weighed one pound and three-quarters. On splitting it open longitudinally a rounded tumor the size of a tennis ball was found occupying the lower half of the medullary portion, and extending into the pelvis as a soft papillomatous mass. The pelvis was filled with coagulated blood, and two smaller papillomata were found springing from its upper part. A great part of the tumor consisted of disintegrated coagulated blood, on washing which away, the papillomatous character of the new-growth could be demonstrated. The cortex of the kidney was healthy, but somewhat atrophied from pressure over the most prominent part of the tumor.

ABBE, ROBERT.—Sarcoma of the kidney. "Annals of Surgery." Vol. 19, 1894, p. 58.

A little girl two years old was found to have a large tumor in the abdomen. She had a trace of albumen, but no cysts, sp. gr. 1.015, acid, no blood. Some time before, child had passed blood with the urine on two occasions. Diagnosis of sarcoma of the kidney was made.

Operation was undertaken after two week of observation. The child was enveloped in cotton, except at the field of operation. A transverse incision eight inches long was made over the tumor from the lumbar to median line. The growth was shelled out and a good pedicle formed. This was tied with silk, little blood was lost. The wound was closed with silkworm gut, and drained posteriorly with iodoform gauze. The operation lasted forty-five minutes. The child made a good recovery; no recurrence was observed in two years. The tumor weighed two and one-fourth pounds. It was found to be carcinoma sarcomatosum (Orth).

A child one and a half years old was still nursing. The mother had noticed a rapidly growing tumor in the abdomen for six weeks. The tumor when observed was of enormous size. The child was carefully prepared for operation. Through a

small exploratory incision the tumor was found to be free in the abdomen and covered with large veins. A transverse incision was made with the child in Trendelenburg position. At the base of the tumor the almost normal kidney was found. The tumor seemed to grow from the upper portion of the kidney. The ligature was put about the kidney itself, and the tumor and an inch and a half of kidney cut away. The blood supply of the tumor made another pedicle which was tied off. The wound was closed, after replacing the apparently healthy portion of the kidney and the posterior portion was drained with iodoform gauze. The temperature rose to 105 degrees on the day of the operation but quickly fell to normal and the child recovered. The tumor weighed seven and one-half pounds, the child after operation fifteen pounds. The microscopical examination showed that the tumor was rhabdo-myo-sarcoma.

PENROSE, F. G.—Sarcoma of the kidney, with loose masses in the bladder. Transactions of the Pathological Society of London. Vol. 44, 1893, p. 96.

R. W.,—aged fifty-two, was admitted into St. George's Hospital, under the care of Mr. Bennett, on February 7, 1888. Mr. W. C. Bull, who was then surgical registrar, obtained the following history: The patient said that he had been in perfect health until June 28, 1886, when he woke up to find that he was nearly blind.

Three weeks before Christmas, 1887, he began to have difficulty in getting urine to pass. The stream would stop suddenly and only after some time the water began to dribble away. On January 23, 1888, after having strained hard to pass water, and having been in great agony, he found a long worm-like body issuing from the meatus, and in about a quarter of an hour this mass was shot out of the meatus. Since that time the urine had passed more freely until within a few days of his admission into the hospital, when he had experienced similar symptoms. The mass mentioned above, which had escaped from the urethra, was six inches long and pointed at both ends, apparently a cast of the urethra. It was submitted to Dr. Delépine, who reported as follows: "This cast is partly composed of coagulated blood and partly of tumor-cells. The tumor-cells form masses distributed all through the cast. From their nature the tumor is evidently

much degenerated, and as it is difficult to know whether the thrombosis between them is not partly due to the presence of coagulated blood, it is difficult to say whether the tumor is carcinomatous or sarcomatous in nature (it is probably sarcomatous)."

On admission the patient stated that he had never found any blood in his urine; that during the last two years he had lost about three and one-half stones in weight. He complained of the difficulty with his water, and of a pain behind his left nipple. In the left half of the abdomen a large irregular tumor was found. It occupied almost the whole of the left loin; it reached as far as the middle line, but did not extend beyond it to the right; it presented all the characteristics of a renal tumor.

He was found to have advanced optic atrophy; there were several sebaceous cysts of the scalp which had existed for the last twenty years. The urine which was passed on the first day after admission was clear, acid, of sp. gr. 1012, and contained a trace only of albumen. On February 14th, the urine was reported by Dr. Delépine to be "acid, and to contain albumen and some small round masses, consisting of red blood corpuscles, mucus, and large oval and round cells in an advanced stage of fatty degeneration." On February 23, the urine was clear, acid of sp. gr. 1010, and contained a distinct trace of albumen. The tumor had increased in size considerably since February 7, and had become more nodular. The temperature had been normal throughout. He left the hospital on March 5, but returned again on the 29th, much weaker, with much more pain and with much greater difficulty in passing his water, which was much more albuminous. The tumor had still further increased in size. On April 10th, he became unconscious, and died thirty-six hours later.

At the autopsy the tumor was found to weigh six pounds two ounces. On section it was seen to be firm and yellowish at the periphery, broken down and hemorrhagic in its center. There were no remains of unaltered kidney tissue to be found and the left supra-renal body did not appear to be incorporated in, or to be the starting point of the new growth. The tumor was entirely surrounded by a thin capsule. The left ureter was much dilated and hypertrophical, being one and one-quarter

inches in external diameter. Its opening into the bladder allowed the passage of a large probe easily. The bladder was enlarged; lying loose in its cavity was a small, fleshy looking mass, about the size of a hazel nut, which was encrusted with phosphates. This mass proved on microscopical examination to consist almost entirely of large round sarcoma cells. From the neck of the bladder there grew a similar mass. The urethra was healthy; there were deposits of growth in the retro-peritoneal glands, and in the right lung, otherwise the organs of the body appeared to be healthy. Unfortunately the brain and eyes were not examined.

CARCINOMA OF THE KIDNEY.

Frequency, primary or secondary, age, sex, one or both sides, duration, origin in exciting causes, heredity, congenital, traumatic, two sources of epithelium, (Grawitz), cysts, hemorrhage, carcinoma thrombosis. Symptoms, hematuria, children, adults, edema, disorders of digestion, dyspnea, left cardiac hypertrophy, secondary deposits, calculi, suppuration.

Carcinoma of right kidney, hemorrhage into perinephritic connective tissue spaces, operation, recurrence.

This patient was forty-eight years old; she had passed the climacteric. She had been troubled by no pain but was losing strength all the time. A week previously she had a fainting spell, beginning with pain in the right side. She had not called a doctor. The pain continued and even increased. The temperature was 103 and had been higher, she believed. The pulse was 110. The abdomen was rigid on the right side and a tumor could be felt, which was thought to be the enlarged gall bladder. The right ureter could not be found and the urine from the left ureter was high colored but otherwise normal. An exploratory laparotomy was made. The appendix was normal, the gall bladder empty, but all the organs on the right side were infiltrated with blood. A large tumor in the right side, evidently the enlarged kidney, could be easily found. The lumbar incision was made and the kidney reached. All the perinephritic tissues were infiltrated with dark blood. The kidney was opened and was found completely disorganized and filled with clots and fluid blood. A clamp was placed on the pedicle of the tumor and all the kidney substance scraped out. The wound was packed with

iodoform gauze and the clamp removed. There was no hemorrhage. The wound closed promptly. The examination showed the tissue to be carcinoma. The tumor recurred in about four months.

ROBERTS, W. O.—A large sarcoma of left kidney in a child five years old; nephrectomy; recovery. "New York Medical Times," August, 1894.

The first of last December I was called to Shelbyville, Ky., to see a child who will be five years of age the coming April. The mother stated that four weeks prior to my visit, she noticed that the child's abdomen was much larger than it should be, and, examining it, she discovered a tumor considerably larger than a man's double fist. The child had never complained of any pain or discomfort in any way. The mother was led to make the examination simply by the prominence of the abdomen. While running about, four days before my visit, the child had fallen flat on his face. He then commenced complaining a great deal about his abdomen and was put to bed. At the time of my visit his temperature was 100° F. and had been so for three days. There was considerable pain and tenderness over the left lumbar region; the child was lying in bed with the legs drawn up. Upon palpation, it was questionable whether there was fluctuation or simply elasticity of the tumor. I suggested that we aspirate to see whether the growth contained any fluid; this was done at three different points and nothing except a little blood secured. I then made the diagnosis of malignant disease of the left kidney. I made my diagnosis chiefly upon the tympanites along the region of the colon. I did not see the child again until the latter part of December. At that time the tumor had grown considerably; it filled the whole left side of the abdomen down almost to Poupart's ligament, and extended over about two or three inches to the right of the median line. The case was brought to this city for operation, and on January 17th, assisted by Dr. Anderson and a number of other gentlemen, I made first a short exploratory incision—a perpendicular one—for the purpose of settling the diagnosis as to the organ involved; it proved to be the kidney, as I thought. The spleen was perfectly normal as to size, but was pushed up, of course, by the growth. In this exploratory incision there was an opening made

in a little vein on the surface of the tumor, which bled very freely, and it was with difficulty the hemorrhage was controlled. I had explained to the father before making the exploratory incision that if the tumor was found of such a character that it could not be removed without too great risk, the abdomen would be closed. When the bleeding occurred from the punctured vein, I, with the father's consent, went ahead and removed the tumor. I did the operation suggested by Abbe, which consists in opening the abdomen transversely instead of perpendicularly. The short incision made was about two inches, I suppose, to the outer border of the left rectus abdominis muscle. I then carried the other across the abdomen one inch below the ribs, back to the lumbar region and across the outer border of the right rectus; that brought me down directly upon the growth. We found the descending colon so closely adherent that it was with some difficulty we were enabled to detach it. When we had dissected down to the pedicle of the tumor, the child seemed so nearly dead, that I did not take time to pick out the ureter but tied off the body *en masse*, I found that the tumor grew from the fibrous covering of the kidney, only a portion of the kidney seeming to be involved in the growth; the kidney, however, was removed in its entirety, as I was afraid the other portion might be infiltrated, and which could not be detected at the time. After removal of the growth the wound was closed by three lines of continued sutures; it had to be done very rapidly, owing to the extreme condition of the patient. The peritoneum was brought together first, then the muscular structures, then the skin and fascia. The child was put to bed in almost a moribund condition; however, he rallied, and went along to recovery without an untoward symptom. He was discharged from the Infirmary yesterday in good condition, with the wound healed. The tumor, which I exhibit for your inspection, was found to weigh immediately after its removal seven and a half pounds.

ABSCESS OF KIDNEY, SUPPURATIVE NEPHRITIS.

Source of infection; through the blood; pyemic; secondary mixed infection in smallpox, scarlet fever, whooping cough and diphtheria; direct in endocarditis, osteomyelitis, mastoid disease, and puerperal infection; through the urinary tract; in obstruction in urethra, bladder or ureter; in infection

with gonorrhea and suppurative diseases. Traumatic localization of infection. Extension of infection from neighboring organs.

One sided, urinogenous, traumatic, surgical kidney, double sided, pyæmic. Single and multiple foci; cortical and pyramidal. Natural course of suppurative nephritis; toxemia; abscess discharge in neighboring viscera; perinephritic abscesses, pyemia. Forms of infection; gonococci streptococci, staphylococci, putrefactive bacteria. Indications; irrigation of kidney, drainage, extirpation. Pathological findings, capsule, cortex, pyramids, ureters.

The question of treatment in suppurative nephritis evidently depends upon the integrity and health of one kidney. It is useless and criminal to undertake a mutilating and hopeless operation on one kidney while the other is equally diseased or incompetent. In the female it is easy to determine the condition of the kidneys by catheterization. In the male this is more difficult and sometimes impossible. If one kidney is intact, there may be indications for operating on the other kidney. If both kidneys are diseased operation can be undertaken only in exceptional cases.

The treatment of suppuration in the kidney must necessarily depend on the character and origin of the disease. Gonorrheal pyelitis has been successfully treated by irrigation (Kelly), pyenophrosis from calculi and after injury, frequently recovers after nephrotomy and drainage, but multiple abscesses of the kidney can be successfully treated only by extirpation of the kidney.

WEIR, ROBERT F.—The surgical treatment of surgical kidney. "N. Y. Medical Journal," September 15, 1894.

The patient was a young man twenty-five years old who had a gonorrhea four years before and again one year before observation. Nine months later he contracted a new and severe urethritis which extended to the bladder. He suffered from increased frequency of micturition, tenesmus and blood in the urine. After prolonged treatment and without any instrumentation or other assignable cause he had a chill; temperature 101 and vomiting, diarrhea and prostration. He complained of pain in the loins; this increased in severity and the temperature rose to 103 degrees. Tenderness in the right renal region was elicited by bimanual palpation. The patient grew worse. The symptoms

continued those of pronounced sepsis. The surgeon decided to cut down and explore the kidney. He found many small abscesses over the kidney surface. He removed the whole organ. The temperature dropped from 105 to 99, after operation. The patient made a good recovery. The kidney was found enlarged and contained many small abscesses.

PENROSE, FRANK.—Absence of upper two-thirds of left ureter, with very small cystic kidney. Surgical right kidney after gonorrhea. "Transactions of the Pathological Society of London."

The patient was a man about twenty-five years old. He had a gonorrhea eighteen months ago which still continued. A month ago he felt so ill that he gave up work. He had pains in the legs and great weakness. He fainted and was taken to a hospital, where he died in twelve hours.

On post-mortem the upper two-thirds of the left ureter was represented by a fibrous band. The lower third was well developed and pervious. The left kidney was a few small cysts; its blood vessels were diminutive. In the right kidney were two abscesses which had evidently existed some time. The ureter and pelvis were considerably dilated.

GRAVES, SCHUYLER C.—A case of lumbar nephrectomy for pyo-nephrosis. "Medical News," Philadelphia, October 12, 1894.

The patient, Mrs. H. B. K., aged fifty-two years, the mother of six children, fell, when eighteen years of age, from a porch, striking her right side just below the ribs. From that time until recently she has been conscious of trouble in that locality, experiencing dragging sensations in the abdomen, and finding it more and more impossible to lie upon her left side, because of cardiac palpitation, which seemed to be due to her injury, or its results.

About three years ago she first noticed a lump in the right side of her abdomen, which was freely movable in all directions. While standing upright the tumor would sink below the level of the umbilicus, producing painful, dragging sensation; but when the recumbent position was assumed it would slip behind the ribs, and thus lie beyond sight and touch. Whenever the patient, however, would attempt lying upon the left side the tumor

would press against the stomach, invariably producing palpitation of the heart.

Shortly after the discovery of the tumor by the patient a physician in this city, after a careful examination, declared it to be a pedunculated uterine fibroid, adding that when the patient's "change of life" had been passed the tumor might gradually disappear.

In April of the current year, the patient was taken to the Homeopathic Hospital in Chicago, where she was examined by Dr. R. Ludlam, of the hospital staff. This surgeon at once pronounced the difficulty to be a floating kidney and recommended an operation for the purpose of anchoring the same. This was consented to, and, early in May, 1892, the operation was done.

It seems that a man who could do a nephrorrhaphy would recognize disease, and, if necessary, do a nephrectomy; and therefore, it is my opinion that at least *active* nephritic disease was not present at the time of Ludlam's operation; but, be that as it may, the woman never recovered from the nephrorrhaphy. She returned to the city, and got up about the house; but the track of the drainage-tube never healed, leaving a sinus, from which pus constantly trickled. She began to lose in flesh, and her friends suggested further surgical interference, which she always declined until I saw her, September 30th, last.

During the week just preceding this date her physical deterioration was so marked that she consented to a consultation.

A pale, anemic, emaciated woman, of about fifty years, with a dry, hot skin; a dry, coated tongue; pulse 120, and weak, with a temperature of 103 degrees F.

She had been bedridden for about a week, and had experienced a severe rigor the day before my visit. Upon inspection locally, the tumor could be easily made out, elevating, to a decided degree, the abdominal parietes. The lumbar incision, which had been made horizontally, presented several sinuses, from which thick, creamy pus was streaming. Bimanual manipulation showed a greatly enlarged viscus, and elicited quite decided fluctuation.

The urine voided, though of febrile color and considerably

deficient in normal twenty-four hours' quantity (about a quart), was clear and free from albumin, and these features, together with the fact that an operation under such circumstances would be secondary in character, thus affording our patient the unquestioned advantages connected with secondary operations in stopping exhaustive drains upon vitality, decided me in recommending a nephrectomy. Consent having been given, the patient was conveyed to the hospital, and prepared for the operation, which was done on the following day, October 1st.

The patient being under chloroform, the lumbar cicatrix was broken up by the finger and the kidney easily located. It was, as expected, the seat of multilocular disease, some cysts containing serum, some gelatiniform fluid, and others pus; the organ was several times larger than normal.

It was tapped, and the cysts broken up as much as possible by use of the finger; adhesions were detached carefully and the viscus delivered through the wound, which had been extended somewhat beyond the limits of the original incision. A Byford's hysterectomy clamp was placed upon the pedicle and the organ liberated by the scissors.

It was found that, in spite of carefulness, a rent, $1\frac{1}{2}$ inches long, had been made through the peritoneum, showing the colon and the edge of the liver.

The abdominal cavity was thoroughly flushed with hot, boiled water; the rent in peritoneum stitched by means of a continuous suture of aseptic catgut, and a counter-opening made in this membrane at its lowest point, through which a short glass drain was inserted into the peritoneal sac. The clamp was left *in situ*, and the greater portion of the lumbar wound closed by deep interrupted sutures of silk. The drain was held in position by iodoform gauze packing, and antiseptic dressing was applied.

Shock was pronounced, but hypodermatics of strychnine, atropine, and digitalin, together with hot beef-tea by the mouth, brought on reaction, and the physical condition four hours after the operation was quite fair.

On October 4th, the patient had rallied from the shock, was in good condition, and the prospects for recovery were excellent. The temperature had not reached 101 degrees since the opera-

tion, and the pulse was full, fairly strong, and remaining in the neighborhood of 100. The clamp was removed this afternoon, and the wound washed and repacked with iodoform-gauze. No hemorrhage took place. The patient was in good spirits and was well nourished. The bowels and bladder have moved naturally, the quantity and quality of the urine furnishing a good indication as to the excellent condition of the remaining kidney.

On October 6th the dressings were changed again. Very little pus was present, and there was no sign of peritonitis. The glass drain, practically dry, was removed, the wound irrigated with a mild mercuric chloride solution, and fresh dressings were applied.

On October 8th the pulse was 80, the temperature 98.6 degrees, and the wound in excellent condition. The appetite was good, and the tongue moist and clean.

On October 18th quite a bit of slough came away, and on October 21st sloughing continued the entire forenoon.

On October 22d the urine was found to be ammoniacal, loaded with crystals of the triple phosphates, and a slight trace of albumin was present. The patient was put upon benzoic acid, 10 grains *ter in die*.

The general condition was excellent on October 28th, and the patient left the hospital for her home, feeling very well.

The urine under the benzoic acid gradually cleared up, and on November 10th the patient was walking about her rooms, rapidly regaining her former state of health.

KELLEY, HOWARD.—Gonorrheal pyetitis and pyo-ureter cured by irrigation. Bulletin Johns Hopkins Hospital, 4, 47.

She had an extensive accumulation of pus in the left ureter extending up into the pelvis of the kidney, caused by a stricture of the vesical end of the ureter and associated with gonorrheal infection. It was treated by dilating with ureteral catheters 2 mm. to 5 mm. After drawing off the purulent fluid, the ureter and pelvis of the kidney was washed out with antiseptic solutions, the calibre of the stricture was enlarged, reducing the quantity of the accumulation above it from 150 cc. to 100 cc.

The purulent character of the secretion was removed and all gonococci disappeared.

The patient was married; she had one child four years old. This was her only pregnancy in six years of married life. There was pain on urination and the urine as noticed by her was sometimes clear and at other times cloudy with yellow sediment. My examination showed that the vaginal outlet was torn back near the anus, but was well lifted up under the symphysis by an intact levator ani. The cervix was in the axis of the vagina, somewhat low down.

The ureters were then palpated *per vaginam* and the left distinctly felt to be harder than normal and somewhat thickened, but without marked tenderness. The left ureter also showed a displacement toward the pelvic floor.

The bladder was examined under atmospheric dilatation with the patient in the knee-chest position, through the No. 10 speculum. There were abundant evidences of a patchy, mild grade of cystitis. The field opposite the ureter, the posterior pole, and its surrounding area were of a mottled red, injected appearance, the vessels being entirely obscured; this injection increased towards the vault, where no normal background appeared. The vault over an area 4x5 cm. was covered by fine granules, averaging one or two to the square millimeter, most marked on the right side. The tips of each of these granules reflected the light and gave the surface a bright studded appearance. On the left side in places the surface presented a superficial worm-eaten appearance. On the right lateral wall 2½ cm. behind the ureteral orifice was a ridge 2 mm. in height, extending downward to the base of the bladder. Near the right ureteral orifice was an area of intense congestion presenting an edematous appearance, surrounding the ureter, whose orifice could only be located by a little pallor in the form of a crescent.

Posterior to the right ureter was a superficial ulcer 2x3 mm., with a narrow red border and a yellow centre.

The left ureteral orifice was situated on a truncate cone about 6 mm. in diameter at its base and 2 mm. at the top. It was slightly edematous, and on the urethral side broken up by a number of irregular papillary eminences. The site of the ureteral

orifice at the first examination was marked by a yellow spot of pus. On introducing a searcher into the opening of the orifice, a thin stream of pus escaped and ran down over the bladder wall.

Upon leaving the ureteral catheter in the left ureter for three minutes, 11 cc. of dark fluid escaped, followed by 6 cc. of fluid containing pus. In the twenty-four hours following the examination the patient passed 700 cc. of urine.

During the whole time the patient was under treatment, lasting from the 1st of March to the 4th of August, 1894, I catheterized her left ureter about 120 times in all. The first three weeks of her stay were passed in vain endeavors on my part to get the ureteral catheter well into the ureter. Three difficulties prevented this at first. In the first place the irregular papillary prominences on the left side in the neighborhood of the ureteral orifices obscured it and made it impossible to locate it with certainty, after the first examination in which the pus was seen in it as stated; in the second place the location of the orifice was unusual, lying extremely displaced to the left; in the third place there was a spiral stricture of the intravesical portion of the ureter, and it was necessary for me to learn the twist of the stricture before I could pass the catheter at once at every sitting. I cannot say too much in praise of the tenacity and pluck of my patient throughout the first part of the treatment, which was very trying to me and more so to her, as I was entirely uncertain as to the ultimate outcome and could give no positive assurances.

After almost daily efforts for three weeks the stricture was finally cleared by an accidental turn of the hand; this was more readily repeated on two or three occasions subsequently, but not without discouraging failures, when the ureteral orifice was definitely located on the side of the pyramid in relation to certain papillæ and the direction of the stricture was ascertained so that the catheter could after this be passed with ease. After pushing the catheter through the stricture it entered about 8 cm.; a distinct sense of resistance was felt in attempting to withdraw it, due to the bite of the stricture, which was about $1\frac{1}{2}$ cm. long. So long as the point of the catheter went no further than the stric-

ture no urine escaped, but as soon as the catheter cleared the stricture, pale urine began to pour out in a steady stream, continuing until 130 cc. was collected in three minutes. Sometimes the first urine drawn off would be of a reddish-brown color, followed by a whitish sediment, and at the last a thick, creamy fluid like pure pus.

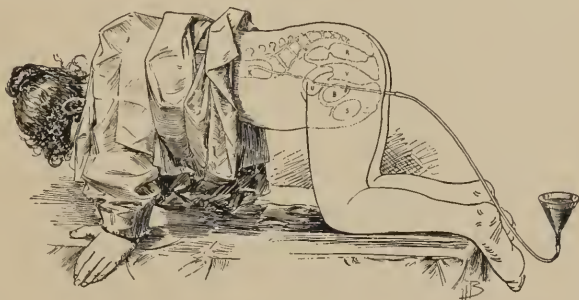
The fact that so much urine escaped in so short time proved conclusively that the case was one of extreme dilatation of the left urinary channels above the stricture, for the normal rate of secretion is but one cubic centimeter a minute for both ureters together, or one and a half in three minutes for one ureter. The discharge of 130 cc. would be twenty-nine times the normal amount, or at the rate of about twenty-two gallons a day for both sides together. Thus by a *reductio ad absurdum* proving that the case was a dilated pyo-ureter and pyelitis.

After drawing off all the fluid, a piece of fine rubber tubing with a funnel at the end was connected with the catheter, and a saturated boric acid solution, two-thirds of the quantity of fluid taken out was run into the ureter by gravity, by simply elevating the funnel filled with the fluid from 40-60 cm. above the level of the bladder. Care was taken to have the tubes full of fluid so as to inject no air. The patient during these manipulations was in the knee-breast position. She took no anesthesia, as the treatment was not painful. After introducing the catheter into the ureter she raised her body on her hands so as to make it horizontal, to better dispose the fluid to run out. When the injection was given she again let her chest down to the table, and rose again when it was to flow out. I found that I could wash the urinary tract repeatedly with the same fluid if I desired it, by holding the funnel high, when the fluid should run in, and by holding it an equal distance below the level of the table when all the fluid would well back into it again, often bringing too a considerable amount of shreddy white debris from the ureter.

After the first few treatments of this kind she began to experience relief from her pain and was much less frequently disturbed at night.

An examination of the urine made by Dr. Barker in the

pathological laboratory of the Johns Hopkins Hospital states that it was of a straw color, neutral in reaction, and containing an abundant muco-purulent, stringy, tenacious sediment. There was a small amount of albumen, but no sugar and no casts. The specific gravity was 1032. There were a great many polynuclear leucocytes, crowds of pus cells, and many diplococci, nearly all of which were within the protoplasm of the leucocytes. Octahedra of calcium oxalate were found, and a few cylindroids. There were no tubercle bacilli, and no other bacteria than diplococci, which were of the typical appearance of gonococci, and much smaller than staphylococci or streptococci.



The bladder walls were treated by occasional applications of a five per cent. solution of nitrate of silver, applied directly to the affected areas on absorbent cotton with an applicator, and by daily irrigations of a bichloride solution 1-150,000.

My first effort in the treatment of the case was to secure a continuous drainage of the ureter, avoiding all accumulation above the stricture, hoping by this plan to induce a contraction of the ureteral walls. To do this I made a short ureteral catheter 2 mm. in diameter and 5 cm. long, with a little shoulder about 2 cm. back of the inner end to keep it from slipping out of the ureter after introduction, and with a flange 6 mm. in diameter at the lower end to keep it from slipping altogether into the ureter. I placed this in the ureter by means of a searcher used as a mandarin to conduct it through the stricture. I found, however, that its presence gave so much pain and increased the irritation of the bladder, after being in place for twelve hours,

that I was obliged to abandon its further use, although it acted well mechanically.

My next plan, which was successful in curing the case, was to have ureteral catheters made in four sizes, increasing from the smallest, 2 mm., to the largest, which was 5 mm. in diameter. The points of the catheters were blunt and straighter than the ureteral catheters ordinarily used, on one side almost on a line with the shaft.

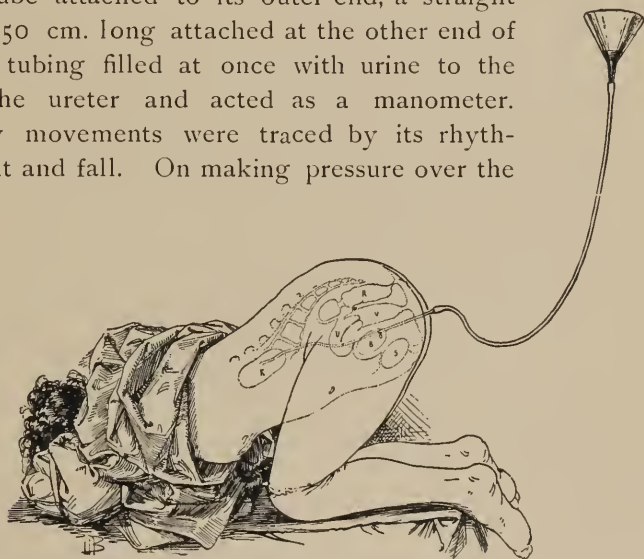
In the course of two months the ureter was dilated sufficiently to permit the introduction of the largest catheter, from the end of which the accumulated urine would drop in a large free stream. With the catheters I began systematically to wash out the ureter and kidney with a bichloride of mercury solution 1-150,000, constantly increasing the strength until 1-16,000 was used. The treatment with the bichloride was interrupted several times for the injection of a one per cent. nitrate of silver solution, and once for a weak iodine solution. Toward the end while using the larger catheters I was obliged some six times to suspend the treatment for from two to three days on account of a chill followed by elevation of temperature from 102 to 104 degrees F. with a quickened pulse (120), headache, nausea and pain in the left inguinal region and legs. She was flushed and restless and suffered from sleeplessness at these times.

The result of the bichloride washings was a complete disappearance of pus cells, leucocytes and gonococci from the urine, and the reduction of the size of the distended ureteral tract from one holding regularly from 140-150 cc. down to 90 or 100 cc. The bladder assumed a normal appearance and she became able to sleep through the night without rising once. She gained 20 pounds in weight and resumed the rosy appearance of perfect health, with a corresponding remarkable improvement in spirits.

The treatments were discontinued August 8, 1894, and I saw her again in January, 1895, and then on two occasions catheterized the ureter, drawing off only 90 and 100 cc. of clear urine from the left ureter without a trace of pus or cocci. She has therefor recovered from the infection, but still has a stricture of the ureter of larger calibre, with a lax distended ureter above it.

I made several attempts to empty the ureter by massage, with considerable success at first, but the procedure became so painful that it had to be stopped. Just before the massage the bladder was emptied by catheter, and immediately after treatment as much as 90 cc. of urine were secured.

I demonstrated the success of the massage and mapped out the exact positions in which to make pressure, by placing a catheter in the ureter with the patient in the dorsal position, with a rubber tube attached to its outer end, a straight glass tube 50 cm. long attached at the other end of the rubber tubing filled at once with urine to the level of the ureter and acted as a manometer. Respiratory movements were traced by its rhythmical ascent and fall. On making pressure over the



ureter through the abdominal wall the column ascended in the vertical glass, and by increasing the pressure could be forced out over the top. If the pressure was made to one side there was only a slight effect or none at all. By marking all the points of effective pressure on the skin and afterward connecting the markings, the course of the ureter was accurately mapped out.

The following novel and important points are demonstrated by this case :

1. Stricture of the lower extremity of the ureter can be diagnosed without any operation, by using the cystoscope with the bladder dilated with air by posture.
2. Stricture of the ureter can be improved by gradual dilata-

tion by a series of hollow bougies (catheters) and without a kolpo-ureterotomy. (See KELLY, Johns Hopkins Gynecological Report, No. 1.)

3. A stricture through which a No. 5 (5 mm. diam.) bougie is passed every day for several weeks will still hold back the urine if the walls of the ureter above have lost their contractility.

4. Pyo-ureter and hydro-ureter can be diagnosed by drawing off in a few minutes such a quantity of fluid as it is manifestly impossible for the kidney to secrete in that amount of time.

5. Pyo-ureter and pyelitis can be cured by washing out the ureter and pelvis without any preliminary cutting operation to disclose the urethral orifice (as in kolpo-uretero-cystotomy, Bozeman).

6. Variations in pressure in the column of fluid in a distended ureter can be demonstrated by a manometer attached to the ureteral catheter.

7. In this way the course of the ureter can be mapped out.

DAVIES-COLLEY, J. N. C.—Caries of lumbar spine, abscess, destruction of right kidney and ulceration into duodenum, lumbar incision; death.

The patient was a married woman twenty-four years old, with advanced tubercular disease of the spine. She died after an operation intended to drain an abscess near the curvature. The right kidney was found at post-mortem nearly destroyed by the abscess going out from the fourth and fifth lumbar vertebræ.



SUTTON, J. BLAND.—Tumors innocent and malignant. Philadelphia, 1893, p. 384.

The accompanying figure represents a pyonephrosis in one-half of a horseshoe kidney. This figure and case are interesting chiefly to show the numerous and almost unaccountable emergencies which may meet the surgeon. These remarkable complications can not be better illustrated than by the second figure. Here we may suppose the ureters had been catheterized. Urine came from the normal left ureter. The catheter passed into the normally placed right ureter, while at

the same time the pus would pour out of the urethra where the abnormal and accessory dilated ureter emptied. The relation of dilatation to the abnormally placed ureter must also be considered.

ISRAEL, JAMES.—Erfahrungen ueber Nierenchirurgie. "Archiv fuer Klinische Chirurgie." 47 B. p. 302.

1.—Louis P., aged twenty-three, perfectly well, with exception of a frequent, acute, exacerbating gonorrhea; bladder not involved. December 1, 1887, had a chill and high fever, combined with severe backache, radiating into the legs. Excruciating pain in the region of the left kidney going toward the stomach. Owing to the severe pain the patient was obliged to remain in the dorsal position continually.



Three weeks after the appearance of the first symptom, temperature was 39 degrees C., frequent chills; tongue red, smooth, dry and shiny; finger tips and lips cyanosed; eyes sunken; scanty urine, high specific gravity, slightly clouded from few pus cells which were only microscopically visible.

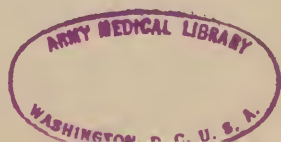
The lower ribs, hypochondrium and left lumbar region showed evidence of a large kidney tumor, which extended to the median line on the right, umbilical plane below, 6th intercostal space above, filling entire lumbar region.

Nephrotomy was performed and the kidney found to be converted into a large pus sack lined by a smooth membrane. In the upper portion of the sack a few shallow cup-like excavations could be felt, as a indication of the enlarged, flattened calices.

In the walls of the sack, which collapsed upon evacuation of the pus, there was found nowhere more than 1 millimeter of the original kidney substance.

2.—Richard B., thirty-five, left-sided pyonephrosis. At twenty-two he had gonorrhea twice; entirely cured; remained well until twenty-nine, when he had a feeling of fullness and distention of the bladder, dribbling of clear urine without any increase in quantity.

After the expiration of a year, he was catheterized several



times, which revealed habitual retention, the urethra being entirely free. The urine remained clear for four years, then became cloudy with frequent micturation. No more sounds were passed.

Since two years past, patient had pain throughout the entire length of the urethra, and especially immediately before micturation.

Pain in the region of the left kidney has been present but a very short time.

Upon examination, a normal urethra was found, small prostate, flabby bladder with a very much diminished muscular power and filled with an alkaline urine, mixed with pus.

In addition to this there was swelling in the region of the left kidney, and from this, down to the Lig. Poupartii, the ureter was easily palpable.

The bladder was irrigated, and pressure brought to bear on the kidney tumor, which immediately diminished in size, pus at the same time entering the bladder.

After the nephrotomy a French bougie "12" was passed through the ureter into the bladder, where it was detected cystoscopically; a catheter was passed into the bladder, and fluids injected into the pelvis of the kidney passed through the urethral catheter in a full stream, thereby demonstrating that the ureter was very much dilated.

The incision healed with the exception of a small fistula, which closed eventually, remaining so up to date. Patient gained seventy-three pounds in about four years.

3.—Nephrotomy. Two large abscesses, having no communication with the pelvis of the kidney, were opened, and a large amount of foul smelling pus evacuated.

The following results were obtained from the secondary extirpation of the kidney: Upon section, no semblance of outline of kidney; in the cortex and medulla cavities as large as an almond, containing reddish tinged pus and flabby granulations and lined by flabby, yellowish-red pyogenic granulations. These cavities were surrounded by concentrically arranged connective tissue, growing irrespective of the kidney substance.

In the cortex, near a large abscess, slightly raised yellowish masses, running partly in the direction of the medullary rays, and partly irregularly. In the larger masses, the sandy consistency is easily detected. The pelvis is obliterated, and the hilus is replaced by a hard, knotty fibrous mass the size of a chicken's egg, which surrounds the ureter. Caseous masses, tubercle bacilli or nodules were not discernable microscopically.

CALCULI OF THE KIDNEY.

Distribution in age, sex, in fetal life, at 5 years; 15 years.

Forty-five per cent. of 5900 found by Civiale in children.

Blood, pus, coagula, crystals and cast the basis of calculi: rarely parasites. The same chemical forms as in the urinary bladder. Single or multiple (15). All sizes up to 100 grams. Usually only on one side. The left most often.

Chemical constituents, mode of growth, geographical distribution; relation to diet, occupation, habits, digestion, water and air.

The stones often pass into the bladder through the ureter. The retained calculi locate infection. Compensatory hypertrophy of opposite kidney.

Pressure atrophy of kidney substance, pyonephritis, ulceration and rupture of sack. Perinephritic abscess formation.

Diagnosis. Symptoms, pain, tenderness, colic, urine, heart, bimanual examination, crepitation, catheterization of ureters, acupuncture.

RAND, H. W.—Report of a case of renal calculus. Nephro-lithotomy. "N. Y. Medical Journal," July 21, 1894.

The patient, a boy aged fourteen years, stated that he had at times during the past three years suffered from severe pain in his right side. It was most likely to appear and most marked during such exertion as running or jumping. At first it lasted only a few minutes at a time, and was confined to the loin and abdomen, not extending to the testicle. It was always associated with frequent and sometimes painful urination. The urine was often dark, but so nearly as he could tell did not contain blood. Since last August his paroxysms of pain had become more severe and of longer duration, sometimes lasting all night. The most comfortable posture during these paroxysms was semi-erect, with the trunk bent to the left side. His father states that since the boy was five years of age he has been in the habit, when walking or playing, of leaning to the right side and holding his hand to that side.

The patient was well nourished, but pale. Palpation showed the right kidney to be somewhat enlarged and very tender.

During a paroxysm of pain the most marked tenderness was found to be immediately above the crest of the ilium in the axillary line and not over the kidney. Muscular rigidity in the loin and over the abdomen was also prominent during pain.

Upon these symptoms, the diagnosis of probable renal calculus was made and operation advised. Examinations of the urine tended to confirm this diagnosis. The report on two specimens was as follows :

No. 1.—Total quantity in twenty-four hours, fourteen ounces ; reaction, acid ; specific gravity, 1.020 ; albumin, a trace ; sugar, none ; total quantity of urea, 97.16 grains. Microscopical examination showed uric-acid crystals in abundance, flat epithelial cells, a few leucocytes, and some stringy mucus.

No. 2.—Total quantity in twenty-four hours, forty-three ounces ; reaction acid ; specific gravity, 1.014 ; albumin, a trace ; urea, 213.28 grains. Microscopical examination showed oxalate of lime crystals in abundance, a few red blood-cells, some leucocytes, mucous cylinders, stringy mucus, small round and flat epithelium.

November 4th, I exposed the kidney by an oblique lumbar incision and found it enlarged and its lower end extremely hard, feeling more like fibrous tissue than normal kidney. No stone could be felt by palpation. While passing a fine needle into the organ in different directions I felt at one point a characteristic grating sensation, and on opening the pelvis found the stone at its lower extremity. No second concretion could be detected. A drainage-tube was introduced to, but not into the kidney, the upper portion of the wound in the loin closed with sutures, and the lower part lightly packed with gauze. The calculus weighed thirty-four grains. It was of a somewhat irregularly triangular shape, two of the angles having the conformation of a mulberry calculus, the third being less roughened. At spots over its surface were deposits of crystals of uric acid. The pain following operation was quite severe and continuous. At the end of twelve hours he passed, voluntarily, eight ounces of bloody urine, but for the next twenty-four hours catheterization had to be resorted to, probably on account of the comparatively large amount of opium required to control his pain.

The most noteworthy incident during his convalescence occurred on the third day, when, after six or seven hours of entire freedom from suffering, he was seized with extreme pain in the diseased kidney and along the course of the ureter. His temperature rose rapidly from 101 to 106 degrees F. After several hours his pain suddenly ceased and his temperature fell again to 101 degrees. At the next urination he passed a long, slender clot, which in its course through the ureter had given rise to his pain and high temperature.

No urine passed through the drainage-tube after the third day following operation. The urine remained more or less bloody until the eighth day, after which it was perfectly clear. The wound closed entirely during the sixth week. At present, five months after operation, the boy remains entirely free from pain, and the urine shows nothing abnormal.

CHENOWETH, JAS. S.—Two cases of suppurative pyelitis. "N. Y. Medical Times," September, 1894.

Case No. 1, was a young man, twenty-nine years of age, operated on six weeks ago. He gave the following history: Was born and raised on a farm, and, while never robust, had no especial illness until after moving to Texas, seven years ago, when, getting very much run down from close confinement in an office, he developed a continued fever, which lasted two months. After a year's residence in Texas, with continued ill-health, he returned to Tennessee and Kentucky. Since that time he has never been perfectly well and strong, but has suffered, off and on, with headache, backache and dyspeptic symptoms. Has lost fifteen or twenty pounds in weight in four months; is very despondent; complains of a constant dull frontal headache, and pain in his back and legs; pain in stomach and flatulence after eating. His skin is dry and muddy looking, tongue coated, bowels irregular, pulse 90, and regular; temperature $99\frac{1}{2}$ degrees; examination of heart and lungs negative.

By the introduction of the stomach tube and by the examination of the withdrawn contents, at intervals of from two to eight hours after a test meal, the stomach was found to be moderately dilated, secretion of acid diminished, and digestion slow,

but fairly good for a light meal. Palpation of left kidney region revealed some tenderness extending down over the course of the ureter, but the kidney could not be felt. On the right side there was a very noticeable bulging of the loin, and a tender, firm, movable mass, seemingly about the size of a normal kidney, but varying from day to day, could be felt rising and falling with each respiration. Daily examinations of the urine revealed the fact that there were intermittent discharges of small quantities of blood and pus with the urine, which in the interval was, in this respect, practically normal, but at all times contained large quantities of oxalate of lime crystals. The bladder was slightly irritable, requiring him to get up once or twice at night, but held a good quantity of water. No stone could be detected. Urethra very sensitive. Has never had gonorrhea. Temperature taken thrice daily for a week, showed an evening rise of from one to three degrees.

As stated, there was in the right loin a movable, sensitive mass, which varied somewhat in size from day to day, moved with respiration and which could be pushed up under the ribs in the normal situation of the kidney. Coincident with the diminution in the size of this mass was the appearance of pus and blood and oxalate crystals in the urine; the colon lay in front of the tumor.

An operation was advised for the purpose of drainage and of anchoring the kidney to the abdominal wall, and to remove an oxalate of lime stone from the kidney pelvis, as there was every indication of its presence. The kidney was readily exposed by a transverse incision and carefully palpated between the thumb and forefinger, but no stone found. The introduction of a needle in various directions also gave a negative result. The organ was then drawn into the wound, and an incision, admitting the forefinger, made in the convex border. The hemorrhage was not great and was controlled by the pressure of the finger. The kidney structure seemed healthy; the pelvis was dilated and contained a very small amount of pus, but the most careful search failed to reveal a stone. The ureter was pervious. A rubber drain and a strip of gauze were carried well into the kidney pelvis, and a strip of gauze

packed under the kidney, and all brought out of the center of the external incision, for the double purpose of drainage and causing adhesions which would hold the kidney in its position. Muscles and fasciæ were brought together by buried cat-gut sutures, the skin by silkworm gut; gauze removed on the second day and tube and stitches on the sixth. The fistulous opening, which at first drained freely, closed by the fifteenth day.

The highest point of temperature reached was $100\frac{1}{2}$ degrees, on the fourth day, falling to normal at the end of the week. Since that time there has been a slow but steady improvement in the general condition. The urine still shows some oxalate crystals which are gradually disappearing under a strict diet, nitro-muriatic acid and lavage of the stomach and bladder.

FORBES, W. S.—Indigo calculus from the kidney. "Medical News," Philadelphia, August 18, 1894.

This specimen was found, post-mortem, in the pelvis of the left kidney of a man who committed suicide in February, 1892, by turning the gas on in his room. The man was twenty-seven years old, about five feet nine inches in height, and weighed 150 pounds.

The examination revealed rigor mortis to be well marked. The peritoneum, the pleura, and the pericardium were normal. The heart was slightly hypertrophied, but its valves were normal. Both lungs, were intensely congested and black in color, and did not turn red on exposure to air. They were not edematous. The peribronchial glands were intensely calcareous, and slightly larger than normal. The spleen was normal. The bladder was normal and was partially distended with urine, which on examination was found free from albumin, sugar, casts, pus and blood. This case well illustrates the tolerance sometimes displayed by the kidney to the presence of even large calculi, for upon inquiry of the family of the subject from which the specimen was obtained, no history of pain or other symptom suggestive of the presence of the foreign body could be obtained. The right kidney was slightly movable in the perinephritic fat, but was otherwise normal. The left kidney was surrounded by a thick fibrous

mass, involving the entire perinephritic fat. This inflammatory deposit also involved the blood vessels passing to and from the kidney. The renal vein was much constricted in passing through the inflammatory mass. The ureter was bound by fibrous bands that slightly compressed it. An incision into the kidney revealed a calculus occupying the pelvis and one calix.

Professor W. M. L. Coplin, of Jefferson Medical College, made the post-mortem examination and handed me the kidney, with the calculus *in situ*. The specimen weighs 147 grains; its greatest thickness, fore and aft, is $\frac{1\frac{9}{32}}$ of an inch.

The dark-brown color caused me to think that it was formed of indigo, and drawing it across white paper it left a rough, blue mark, so that I was further impressed that it was perhaps indigo.

Ord, in his most excellent little work on the *Influence of Colloids upon Crystalline Form and Cohesion in Urinary and Other Calculi*, London, 1879, p. 144, has described at length what he believed to be the only specimen of indigo calculus in man that had hitherto been published. His specimen was a flat, hard cake, of the shape and size of a fruit-lozenge, and weighed forty grains; it was partly of a dark-brown color; three-fourths of its surface presenting a blue-black color; it was granular and without polish, and when drawn across white paper left a rough, blue mark.

The stone herewith presented reminded me so forcibly of Ord's indigo calculus that I determined to have it subjected to the same accurate test to which he subjected his specimen. The result was almost identical with Ord's. The dust of the stone was placed on platinum foil, and on applying heat the vapor emitted was collected on a glass slide, a drop of glycerin was added and on comparing the specimen thus obtained with a preparation made in the same way with commercial indigo the appearances were identical. In both cases there were abundant blue prisms mixed with blue granules. The prisms were oblong, with pointed ends, and occasionally truncated.

The color-test was exactly the same in both specimens (Ord's and my own). Sulphuric acid dissolved the powder first

into a brownish and then into a muddy-blue solution, which, after dilution with water and filtration, yielded a clear blue fluid. This fluid gave in the spectroscope a marked band of yellow, without stopping the blue or red rays. The sooty odor on the application of heat was most decided.

NOBLE, CHAS. P.—The relation of urinary conditions to gynecological surgery. "American Medical-Surgical Bulletin," October, 1893.

Noble recites a case which illustrates the danger of death from suppression of urine, after even a simple celiotomy, in women suffering with well-marked chronic kidney disease. This woman had small contracted kidneys, and was a physical wreck at the time of operation. The operation consisted in the rapid removal of a small ovarian tumor, and of a small par-ovarian tumor. The operation consumed only fifteen minutes. In this case, the kidney disease had antedated the presence of the tumor and the vitality of the woman was so reduced that the shock from even so simple an operation caused death from suppression of urine.

He also reports another case which illustrates the favorable issue of operations for large ovarian-cysts, when albumin and casts are found in the urine as a result of the pressure of the tumor. This patient was a feeble and greatly emaciated woman, who consulted him when the ovarian tumor was very large, quite nodulated, and very painful. The presence of albumin and granular casts in the urine, the nodular outline of the tumor, and the fact that it caused great pain, caused him to give a guarded prognosis as to the issue of the operation. The patient's conclusion was that, as he could not promise her positively that she would recover from an operation, she would live as long with the tumor as possible, and then have it out. She carried out this purpose literally, and it was not until her kidneys were greatly crippled, and that she was suffering with paresis of the bowels, and with orthopnea from the pressure of the growth, that she desired operation. The removal of the tumor was easily accomplished, and she made as good a recovery as any patient upon whom he has ever operated. Curiously, she passed very much more urine after her operation than is the rule; the first day

passing 29½ ounces; the second day, 13 ounces, which were measured, and very much more with bowel movements; the third day, 25½ ounces, etc. The condition of the urine constantly improved, and at the present time (three months after operation) it is perfectly normal.

TUBERCULOSIS OF THE KIDNEY.

Sources; hematogenous, urinogenous. Forms; miliary and localized; mixed infection, primary, secondary; course, duration, symptoms, extension, neighboring, metastatic. Diagnosis, cystoscopy, catheterization of ureter. Relation of tuberculosis to stone. Indications for treatment.

MADELUNG.—Ueber die operative Behandlung der nieren tuberculose. "Archiv fur klinisch Chirurgie," Bd. 41, p. 251.

1.—The patient was thirty-one years old; she had two children. After the second confinement she was sick with a high fever for some weeks and afterward lost strength. She had one attack of "inflammation of the bowels." She had obstruction of the bowels and high fever and was in bed nine weeks. After being up a few days she had a relapse and was in bed again for three weeks. For a few weeks she had been better. She had not noticed when the urine first became turbid.

Examination. The woman was very thin, the skin wrinkled and the mucous membrane blanched. There were no enlarged lymphatics; no cough or diarrhea. In the region of the right kidney there was a nodular, somewhat fluctuating tumor as large as a child's head. The temperature was normal. The urine deposited a large sediment full of pus and epithelium. It was loaded with albumin, but no tubercle bacilli could be found.

A lumbar incision was made and the tumor opened. No pus was evacuated. With a sharp spoon a lot of cheesy masses were removed. Tubercle bacilli were not found in these masses. The wound was drained. The course of the disease was without fever. Some cheesy pus came from the wound. In a few weeks tubercle bacilli appeared in the urine in great numbers. The patient left the hospital, soon developed a great bed sore over the sacrum and another over the trochanter. Three months after operation the tumor had grown so as to fill half the abdomen. The urine was a dirty pus, full of albumin, 670–860 ccm. daily.

The patient took large quantities of morphine and died four months after the nephrotomy.

At the post-mortem the right kidney was found five or six times the natural size. It was surrounded by a mass of connective tissue 3 or 4 centimeters thick, instead of by a cushion of fat. The lower portion of the kidney was a large cyst, communicating with the pelvis of the kidney. In the upper part of the kidney was found the opening made at the operation. It was 1.5 centimeters long. This opening and the pelvis of the kidney was lined with tubercular granulations with many cheesy nodules all about. No normal kidney tissue could be found on section. The ureter was tubercular throughout and where it emptied into the bladder there was an extensive ulceration of the bladder itself.

The left kidney and ureter were perfectly sound and no show of tuberculosis could be found in any other part of the body.

2.—This patient was married and thirty-two years old. She had suffered when twenty-eight, from pleurisy. She had an attack of diarrhea and vomiting which confined her to her bed for four weeks. She noticed at that time a tumor as large as a fist, somewhat tender, in the left side. She had, at the same time, a burning pain at urination and frequent desire to urinate. The urine was turbid and deposited a heavy sediment. She gradually lost strength with indigestion and distaste for food. The tumor grew slowly and the pain increased.

On examination, she was found a poorly nourished, pale woman, weighing 99 pounds. Evening temperature 37.8–38.4 degrees. In the region of the left kidney was found a tumor as large as a child's head; the upper surface was smooth and indistinctly fluctuating. Intestines covered the tumor in front. The urine was alkaline, turbid and had a heavy sediment. It was loaded with albumin, pus corpuscles and bacteria. Some tubercle bacilli were found. The daily quantity of urine was between 1000–1820 cubic centimeters.

At the operation a long incision curving backward was made from the ilium upward. The tumor was covered by a very thick capsule, and in trying to separate from surrounding tissues, the peritoneum was opened a number of times and

carefully closed again. The ureter and blood vessels were ligated with strong silk and the kidney removed. The wound was partially closed and packed with iodoform gauze. The operation required forty-five minutes.

The extirpated kidney was about twice as large as normal. A fluctuating nodular sac contained six cheesy masses about as large as walnuts, and communicated with the pelvis by a small canal. The cortical substance was atrophied and thin, mostly only two millimeters thick. In only a few places could small streaks of normal kidney substance be found. Two months after the operation the patient was apparently well, when suddenly there appeared a painful swelling in the lower corner of the wound. This tumor was opened and discharged a few teaspoonful of pus. Three days later the left leg suddenly swelled and became painful. The diagnosis of thrombosis of the left femoral vein was made. It was treated by incision and rest, and a prompt recovery was made. The fistula remained open until a year and six months after the operation, when the patient weighed 150 pounds and was perfectly well.

ORTH, JOHANNES.—Lehrbuch der Specialen pathologischen Anatomie. Berlin, 1889. Bd. II, p. 102.

This is a drawing of a greatly cheesy-degenerated tubercular kidney and ureter. A little of the ureteral wall is still intact. The upper part of the kidney is entirely destroyed; in the lower part of the kidney there is still some intact tissues.



Syphilis of the Kidney.

This is a rare and surgically unimportant disease. It appears as an intra-uterine disease and is rare in the adult. The gumma is the common form, usually small, rarely as large as a walnut, in groups of fifteen or twenty occasionally. This gumma are usually found in the cortex. Rarely miliary foci give the diagnosis of "syphilitic tubercle." When syphilitic foci have been absorbed, scars and depression of the kidney surface remain.

MITCHELL, LOUIS J.—Medical and Surgical Reports, Cook County Hospital, Vol. I, 1890; Vol. II., 1891.

During the six months ending July 1, 1890, there were 3,860 patients treated in the Cook County Hospital, among which were the following:

Perinephritic abscess	-	-	1	Acute nephritis	-	-	8
Movable kidney nephrorrhaphy	4			Chronic nephritis	-	-	34
Cerrhosis of kidney	-	-	4	Pyelitis	-	-	1

During the six months ending December 31, 1890, 3,823 cases were treated, among which were the following:

Movable kidney	-	-	3	Chronic nephritis	-	-	56
Pennephritic cellulitis	-	-	3	Ryonephrosis	-	-	3
Rupture of the kidney	-	-	4	Renal abscess	-	-	1
Cerrhosis of the kidney	-	-	1	Renal colic	-	-	1
Acute nephritis	-	-	7	Tuberculosis of kidney	-	-	1

HADDEN AND ANDERSON.—St. Thomas's Hospital Report, vol. 20, 1892.

Two thousand two hundred and thirty-one surgical cases were treated in this hospital during the year ending December 31, 1890, among which were the following:

Sarcoma of the kidney	-	-	1	Renal calculus	-	-	1
Tubercular disease of bladder	2			Tubercular kidney	-	-	1
Hematuria	-	-	4	Pyonephrosis	-	-	4
Pyuria	-	-	2	Renal senus	-	-	1

BRODEUR, A.—De l'intervention chirurgicale des les affections du rein, Paris, 1886. (Absst. Cent. f. Cher. 1887, No. 20.)

Of the 327 operations 212 were performed on females, 94 on males, with 15 children, and 6 cases in which the sex is not given. In 136 cases the right, and in 105 cases the left, kidney was concerned. In 86 cases the side is not mentioned. Of the 327 operations there were 235 nephrectomies: 125 lumbar with 62.4 per cent. of recoveries, and 110 abdominal with 50 per cent. of recoveries. There were 43 nephrotomies: 34 lumbar with 67.64 per cent. of recoveries, and 9 abdominal with 77.77 per cent. of cures; 39 nephrolithotomies: 36 lumbar with 77.77 per cent. cures, and 3 abdominal, all of which died. Ten lumbar operations for nephrorrhaphy, with 90 per cent. of recoveries. Thus, of the 327 operations 200, 61.16 per cent. were followed by recovery. In 1885 S. W. Gross recorded 233 collected cases

of operation on the kidneys, with a mortality of 44.6 per cent., including 93 nephrotomies, with 23.1 per cent. mortality. In a later communication he gives a collection of 17 nephrorrhaphies with only one death.

REYNOLDS, ARTHUR R.—Annual Report of the Department of Health of Chicago, for the year ending December 31, 1894.

Chicago with a population estimated at 1,567,727 reports 23,892 deaths in 1894. Of this number the diseases of the urinary system are reported as follows:

Calculus	-	-	-	5	Chronic nephritis	-	344
Cystitis	-	-	-	38	Uremia	-	58
Acute nephritis	-			26	Other diseases of urinary		
					organs	-	-
							130-901

CHAPTER II.

SURGERY OF THE URETERS.

CONGENITAL ERRORS.—INJURIES.—DISEASES.—DEFORMITIES.

Anatomical considerations, the ureter in section, its length, course, curve, anatomical relations, entrance to bladder, connection with kidney, map of calibre. Abnormalities of entrance to bladder and union with kidney, double ureters. The ureters, relations, length, size, caliber, structure, blood supply, nerves motion.

Injuries of ureter, accidental wounds, open, subcutaneous, operation wounds.

Operations on the ureter for stone, through the bladder, vagina, rectum, lateral incision extra-peritoneal, laparotomy, intra-peritoneal, by way of kidney. Operations for valve formation in the ureter, intra-peritoneal, extra-peritoneal.

Wounds of the ureter, longitudinal drainage, suture; transverse wounds incomplete, drainage, suture; complete transverse wounds without loss of substance, suture, Van Hook's method; complete transverse wound with loss of substance, extension of bladder, displacement of kidney, transplantation of peritoneum, of vagina, of skin; implantation into vagina, outward upon the skin.

Dr. Walter M. Tanquary, late Professor of Anatomy in the College of Physicians and Surgeons, stated that upon examining the ureters of over twenty bodies he never found one over fifteen inches long, the average being between ten and twelve inches in length. The ureter when stripped from the peritoneum may be drawn out from two to four inches. The curvature of the abdominal ureter has its convexity directed inward; while the convexity of the pelvic portion is turned outward. The pelvic portion of the ureter describes a very strong curve, almost the arc of a circle, since the duct hugs the bony wall of the pelvis very closely. Hence the portion of the ureter opposite the uterus is at some distance from that organ, and as the ureter approaches the base of the bladder (which it enters at a point near the middle of the distance between the urinary meatus and the cervix), it curves rather sharply forward and inward, so that the point in the duct nearest the cervix is below and behind the posterior lip.

It must not be forgotten that the ureter has three points of diminution of caliber which may give rise to mistakes in the search for pathologic stenoses. The first is between one and a half and two and a half inches from the pelvis of the kidney according to Dr. Tanquary's measurements. The second is at the junction of the pelvic and vesical portions. The third when present (found in three out of five subjects) is just where the ureter crosses the iliac artery.

BIDWELL, L. A.—Double ureter. "Transactions of the Pathological Society of London," Vol. 41, 1890, p. 171.

This was a child six months old that died of diarrhea. There were two ureters on each side. Those on the left side opened into the bladder by two openings, those on the right united and opened by a single opening into the bladder.

CABOT, A. T.—"American Journal of the Medical Sciences," Jan. 1892, p. 43.

Woman, aged thirty-nine years. Attacks of renal colic for sixteen years; often followed by passage of stone. Left pyonephrosis felt as distinct tumor. Vaginal examination revealed a small, hard mass in the left broad ligament, close to cervix uteri. Sound in bladder could not be brought within half an inch of mass. Ureterotomy and removal of stone through the vagina. Evacuation of ten to twelve ounces of pus. Tumor in region of kidney disappeared. Uretero-vaginal fistula remained for four months with small amount of pus. The author concludes that the kidney was destroyed so far as secreting tissue is concerned.

EMMET, T. A.—"Principles and Practice of Gynecology," 1884.

Female, click having been elicited by the sound, ureteral stone was suspected. On backward pressure within the bladder with a large sound, stone could be felt through vagina and rectum. Stone cut down upon through vaginal wall by scissors. Opening enlarged forward toward the neck of the bladder. This was the only safe direction on account of danger of opening the peritoneum. The stone was removed and the opening closed with interrupted sutures.

TWYNAM,—"Transactions of the Clinical Society," London. Vol. 23, 1890.

Boy, aged eight years. Left renal pain; hematuria. Laparotomy for diagnosis revealed stone in right ureter just below brim of pelvis. Laparotomy wound closed. Three weeks later extra-peritoneal incision in right iliac region. Ureterotomy, removal of stone, ureterorrhaphy, drainage; recovery. Long end of sutures brought out of wound.

CABOT, A. T.—"American Journal of the Medical Sciences," Jan. 1892, p. 43.

Man, aged forty years; seven or eight sharp attacks of pain referable to left side of abdomen above middle of Poupart's liga-

ment. During three months before operation sensitive spot on back, midway between crest of ilium and twelfth rib. Diagnosis stone in ureter; lumbar incision, ureterotomy, removal of calculus two inches below kidney. Wound in ureter not sutured. Recovery.

RALFE and GODLEE.—“Transactions of the Clinical Society of London.” Feb. 22, 1889.

Woman, twenty-six years of age. Nephritic colic persistent on left side; lumbar nephrotomy; no stone in kidney. Exploration revealed stone in left ureter two inches below kidney. Longitudinal ureterotomy; removal of stone. Subsequent right renal colic; lumbar nephrotomy; no stone in kidney or ureter. Subsequent passage of gravel and small stone *per urethram*. Recovery.

FENGER, CHAS.—“Chicago Medical Recorder,” March, 1893.

Man, aged thirty-five years. Increasing attacks of renal colic for two years; no hematuria; no tumor. Diagnosis, nephrolithiasis; lumbar nephrolithotomy; no stone in kidney. Palpation showed two stones in ureter, one and a half inches below kidney; longitudinal ureterotomy; no sutures. Recovery.

KIRKHAM, F. W.—“Lancet,” London, March 16, 1889, p. 525.

Man, aged fifty-eight years. Right renal colic, followed by pain on left side and anuria. Diagnosis, destruction of right kidney by previous attack. Left kidney now affected. Exploratory left lumbar incision. Palpation of kidney negative. Stone in ureter one-half inch above crossing of external iliac artery. Ureterotomy, removal of stone, no sutures; drainage. Recovery.

CULLINGWORTH, C. J.—“Transactions of London Pathological Society.” Vol. 36, 1885, p. 278.

Woman, aged thirty years; right renal colic. Vaginal examination showed hard masses to right and left of uterus. Diagnosis, right pyonephrosis and independent ovarian disease; laparotomy; right ureter dilated. Stone immediately above bladder; ureterotomy; removal of stone; escape of pus; ureterorrhaphy, with interrupted silk sutures; glass drain in abdomen.

Death from peritonitis in eighty hours. Autopsy revealed right and left pyonephrosis. Sutures in ureter held.

TUFFIER, TH.—Appareil Urinaire. "Duplay et Reclus' Traité de Chirurgie," Vol. 7. Paris, 1892.

Renal colic for nine years, finally with constant pain. Right kidney enlarged. Nephrolithotomy. Examination revealed no stone. Examination of ureter showed hard, ovoid body 3 cm. long, located where ureter crossed the promontory. Stone movable; it was pushed up into pelvis of kidney. Incision of convex surface of kidney. Extraction of stone. Suture of kidney and lumbar wound. No drainage. Healing by first intention.

HALL, R. B.—"New York Medical Record," Oct. 18, 1890, p. 430.

Woman, aged thirty-six years, had had recurrent attacks of renal colic for four years. Pain in region of left kidney, which could be palpated between the hands. Examination caused no hematuria. No stone could be felt. Diagnosis: Stone in kidney or ureter. Dr. Hall was unwilling to make lumbar incision on uncertain diagnosis, and advised exploratory laparotomy. Examination under narcosis revealed a small tumor in region of left kidney: this was the dilated ureter above the stone. Abdominal section. Stone could now be felt about three inches below the kidney. Diagnosis, impacted stone in ureter. Lumbar incision for removal of stone. Stone difficult to dislodge; finally accomplished by hand in abdomen; incision on convex surface of kidney; invagination of sac consisting of dilated ureter and pelvis; extraction of stone. Recovery.

FENGER, CHR.—Operation for the relief of valve-formation and stricture of the ureter in hydro or pyo-nephrosis. "Journal American Medical Association," March 10, 1894, p. 335.

Synopsis: Traumatic stricture of ureter close to entrance into pelvis of the kidney; intermittent pyonephrosis of four years' standing; increased frequency of attacks; nephrotomy; no stone found in sacculated kidney; ureteral entrance could neither be found through wound in kidney nor through incised pelvis; longitudinal ureterotomy revealed stricture at upper end of ureter; longitudinal division of stricture and plastic operation on ureter; recovery without fistula in six weeks.

W. B., a farmer, forty-seven years of age, came under my care, Nov. 12, 1892. Father died as a result of accident. Mother dead; cause unknown; one brother died of phthisis. Patient's health good up to age of thirteen. The present trouble dates back thirty-four years, when as a boy of thirteen, in jumping from a horse to the ground, on account of miscalculation of distance he sustained a violent jerk, his feet not having touched the ground while his hands still retained hold of the hames. This injury was immediately followed by a sharp constant pain in the left side, which was mitigated by blistering, but he was obliged to remain in bed for a month. He suffered no inconvenience with the exception of slight soreness in the region of the left kidney, increased by hard work, until ten years later when, after over-exertion, he had an attack of sharp pain in the left side; at this time he was in bed about a week. One year later he had a third attack which followed free indulgence in liquor. This attack was attended by pain, soreness and obstinate constipation. For the next ten or fifteen years he had four or five attacks a year, lasting from two to three days and always after indulgence in liquor. During the last six years the attacks have apparently been caused by over-exertion, with the exception of one attack a year ago for which no cause could be assigned. The last attack occurred Oct. 22, 1892. It was no more violent than previous attacks but was of longer duration.

Examination: Nov. 12, 1892. Patient well nourished. In left hypochondrium could be found a tumor immovable, hard and not nodular, which extended two inches below the ribs and to within three inches of the umbilicus. Temperature 101 degrees; urine contained a little pus. Diagnosis: Nephrolithiasis in the pelvis or infundibulum, or pyonephrosis from stone or obstruction in the ureter.

November 26. For the past week there has been more pus in the urine, indicating that the contents of the pyonephrosis has been evacuated through the ureter. Examination in narcosis showed that the tumor had disappeared. Operation at the German Hospital. The patient was anesthetized with ether and placed on the right side with a pillow under the loin. An incision was made from the angle of the twelfth rib six inches down-

ward and forward, to within one inch above and anterior to the crest of the ilium. The muscles were strong. After division of the transversalis fascia and removal of a layer of adipose tissue, the adipose capsule of the kidney was exposed, which was so adherent to the surface of the kidney that when it was removed the fibrous capsule was stripped off also. The exposed surface of the kidney was not shining but was red and velvety. It was nodulated, each nodule forming a flat prominence, about two centimeters in diameter. Each prominence was compressible and resembled a dilated calyx. The kidney was of normal size, about nine centimeters long, four centimeters broad and three centimeters thick. In one place a cyst the size of a pea with clear yellowish contents was seen. After excision of a piece of the kidney substance for microscopic examination, the dilated cavity of pelvis and calices was opened, and a jet of urine tinged with pus came out over the wound. The incision along the convex border of the kidney was enlarged by the Paquelin cautery.

Digital exploration revealed that the globular protuberances were dilated calices, which communicated with the pelvis, forming a common cavity. Some of the calices had openings large enough to admit the tip of the finger; others had openings which would admit a No. 10 urethral sound. No small abscesses could be seen on the surface of the kidney or in the incised substance. The protuberances now appeared to be collapsed, but a reasonable amount of kidney substance appeared to be present, especially in the lower part. The index finger was passed through the wound in the kidney down into the pelvis, which was seven centimeters long and four centimeters deep. The wall was smooth and there was no stone or gravel. Neither by the palpating finger nor by the sound or probe could anything be discovered resembling an entrance to the ureter.

The kidney was therefore lifted up over the border of the twelfth rib, so that its anterior surface was directed upward and toward the median line, and its posterior surface backward and downward, thus exposing the posterior surface of the dilated ureteral half of the pelvis. A longitudinal incision, one inch long, was made in the pelvis and the edges held apart with retractors. The

pelvic mucosa looked red and inflamed, but no ureteral entrance could be seen or felt.

The external wound was now prolonged downward for an inch and a half, to within an inch of the anterior superior spine of the ilium, to secure more operating space. The ureter could now be seen as a string or band, not dilated. Its upper end for half an inch was imbedded in cicatricial tissue. A longitudinal incision one centimeter long was made in the ureter half or three-quarters of an inch below the pelvic opening. A small metal probe introduced into the ureter through this incision passed downward freely for six inches. In passing it upward, however, a stricture was found just below the point of entrance of the ureter into the pelvis. The ureter was adherent to the surrounding adipose tissue at this point. The adhesions were separated by the handle of the scalpel and the stricture opened by a longitudinal incision on the probe as a guide. The opened stricture was seen to be one centimeter long. The remainder of the ureter was examined by a French bougie, which would pass down four or five inches, but would then be caught by the ureter. There was no stricture, but a diffuse atrophic narrowing of the ureter. A fine probe or a small bougie could, however, be passed without difficulty into the bladder.

The patency of the ureter was re-established by uniting the wall of the ureter below the stricture to the pelvic wall, leaving the stricture as a loop as shown in Fig. 3. This procedure was similar to the Heinecke-Mikulicz operation upon the pylorus.

The upper part of the wound in the pelvis was closed by sutures. No bougie was left in the ureter. The wound was drained by a large tube passed into the wound in the kidney three inches upward to the upper corner of the kidney. A smaller drain was passed down to the pelvis and ureter. Gauze strips were packed around the anterior and posterior surfaces of the kidney, and three inches down along the ureter. The divided muscles of the abdominal wall were then united, with the exception of the lower three inches, which was packed with gauze. The external wound was united by sutures and dressed in the usual way. The operation occupied two hours. The pa-

tient was weak at its close, pulse 130; much pain along course of ureter. The next day he passed, naturally, water containing no blood. The wound was dressed daily, and the dressings were found to be saturated with five ounces of urine. The amount was determined by the difference in weight of the dressings on application and after removal. The patient steadily improved. The pain decreased, and the amount of urine in the dressings became progressively less. November 29 and 30, blood was found in the urine, which showed that the ureter was patent from the third day after the operation. December 19, half the tube was removed and a day later the remainder was taken out.

Jan. 5, 1893, the wound was closed. The patient was well and strong, suffered no pain and could walk around all day. No tumor could be made out. Pressure in renal region was painless. The urine at this time was normal in quantity, forty-six ounces, and upon microscopic examination of the sediment a few pus cells could be seen. No trace of albumin could be found in the urine. The patient thinks he has gained flesh and is much better than before the operation.

November 14, while the tumor was present and the temperature high, the quantity of urine for the twenty-four hours was eighteen ounces. After the disappearance of the tumor on November 17 and 18, the temperature fell to normal, and the amount of urine increased to thirty-four ounces on November 19, and to thirty-two ounces on November 20. On the evening of the day of operation the patient passed eighteen ounces of urine; on November 27, twenty-six ounces; on November 28, thirty-two ounces, and from this time on the amount of urine passed averaged thirty ounces a day.

KUSTER.—Ein Fall von Resection des Ureter. Arch. f. Klein Chirurgie, Bd. 44, p. 850. [Cited by Fenger.]

The patient was a boy eleven years of age. As a baby and until his fifth year he was sickly, but afterward was healthy. In June, 1889, spontaneous enlargement of the abdomen was noticed, accompanied by pain. This was diagnosed as left hydronephrosis. The urine was clear and sufficient in quantity, indicating

open hydronephrosis. On June 23, Professor Braun made a lumbar nephrotomy which was followed by vesical anuria and the patient left the hospital with a fistula.

On May 25, 1891, the boy was seen by Kuster. The fistula was permanent and little or no urine came from the bladder. The fistula in the lumbar region was dilated and digital exploration of the pelvis made, Catheterization of the ureter from the dilated pelvis could not be effected. The operation was followed by septic pyelitis.

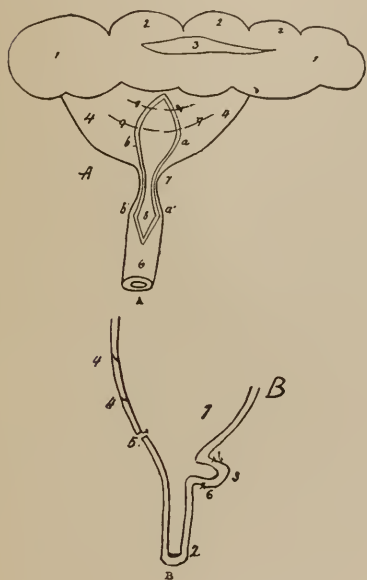


FIG. 1. KUSTER'S CASE. ILLUSTRATING OPERATIONS FOR STRICTURE OF URETER.

A.—Sacculated kidney, dilated pelvis, ureter with stricture at its upper end. 1, kidney; 2, sacs corresponding to dilated calices; 3, nephrotomy; 4, dilated pelvis; 5, opening in posterior surface of pelvis-pelviotomy wound; 6, ureter below stricture; 7, stricture in upper end of ureter; 8, opening in ureter below stricture, extending up through the stricture into the pelvis; 9, sutures closing the upper half of the wound in the pelvis; a-a' and b-b' points of incision in ureter and pelvis to be united by sutures after folding the ureter upon itself at the place of stricture.

B.—Pelvis and ureter after union by sutures. 1, pelvis; 2, ureter; 3, fold of ureter at place of stricture; 4, sutures of wound in pelvis; 5, place of sutures between points a-a' and b-b'; 6, additional sutures, as many as needed, to close borders of the fold formed by approximations of a to a' and b to b'.

July 14, 1891, it was decided to attempt to make the ureter patent, which was accomplished by Kuster in the following manner: A lumbar extra-peritoneal incision was first made into the sac, but the ureter could not be found. The lower end of the sac, the dilated pelvis, was then incised, on the upper border of which was seen a layer of kidney substance the thickness of a thumb. The ureter could now be seen running several centimeters in or upon the posterior wall of the sac, and terminating in a slit in the pelvis. It was then intended to divide the pelvic wall of the ureter by pushing a probe-pointed knife down into the ureter from the pelvis to a point close to its exit from the sac to

spread out the divided walls and unite them to the wall of the sac, thus making a funnel-shaped opening into the ureter (see Fig. 1); but on attempting to introduce a fine probe into the ureter, a stricture was encountered two centimeters below the pelvis. The ureter was therefore divided from above downward as far as the stricture, through which a fine probe could now be passed.

As cure seemed impossible without removing the stricture, the ureter was transversely divided below the stricture and at the entrance to the sac. The ureter was now united to the pelvis by dividing the upper end of the ureter, unfolding the divided end, suturing it to the opening into the sac, and closing the remainder of the wound in the pelvis by catgut sutures.

The next day some bloody urine escaped into the bladder, but ordinarily the urine passed out through the lumbar fistula. From this time more and more urine passed into the bladder until four months after the operation as much as 100 cubic centimeters passed in the twenty-four hours. The pelvis was now washed out for pyuria with one-fourth of 1 per cent. solution of nitrate of silver; this was followed by local and general improvement.

Nov. 6, 1891, the fistula was closed by curetting, dilating and closing the canal by step sutures. In the first twenty-four hours after the operation the patient passed 1,300 cubic centimeters of bloody urine from the bladder. He recovered, but with a lumbar hernia which had to be held in place with a bandage; the fistula remained closed. The boy is able to work and has excellent health. The urine contains a few pus corpuscles and a small quantity of albumin.

VAN HOOK, WELLER.—The surgery of the ureter. "Journal American Medical Association," December 16-23, 1893.

Boy aged 19, suffered from an attack of typical typhoid fever. Following this attack some weeks later he developed a pyonephrosis. Dr. A. E. Halstead, in whose practice the case occurred, invited me to see the case with him. We established a fistula upon the abdominal wall, the sac discharging a large amount of urine. As the fistula remained "permanent" I oper-

ated, upon the invitation of Dr. Halstead, for the purpose of restoring the normal channel for the discharge of the urine. The incision was practically that used by Kuster and others, beginning at a point two inches to the left of the posterior median line, carried down for an inch and a half almost straight and then curved forward toward the anterior superior iliac spine. As soon as the anterior lumbar fascia was opened the ureter was discovered without difficulty. It was smaller than normal and seemed to be atrophied. The kidney, dilated on account of partial closure of the abdominal fistula, could easily be felt in its normal position. Upon opening the renal sac and allowing part of the fluid to escape, the finger could be easily passed into the pelvis of the kidney, but no stone was felt. I then made a ureterotomy and passed a probe up the ureter to meet the finger; but between the finger and the probe I could distinctly feel a valvular fold of mucous membrane. Concluding that this was the obstruction which had prevented the normal discharge of urine, I proceeded to resect after Kuster's method and succeeded in implanting the ureter into the sac much as he had done. It was now thought best to expose the ureter in the direction of the bladder. Upon passing a probe downward a short distance the ureter was found completely closed and on careful investigation its lumen was found to be entirely obliterated for several inches. There was nothing left to do but to extirpate the kidney. The patient recovered.

VAN HOOK, WELLER.—Surgery of the ureters. "Journal of the American Medical Association," December 16 and 23, 1893.

1. Ligate the lower portion of the tube one-eighth or one-fourth of an inch from the free end. Silk or catgut may be used. Make with fine, sharp-pointed scissors a longitudinal incision twice as long as the diameter of the ureter in the wall of this lower end, one-fourth of an inch below the ligature.

2. Make an incision with the scissors in the upper portion of the ureter, beginning at the open end of the duct and carrying it up one-fourth of an inch. This incision insures the patency of the tube.

3. Pass two very small cambric sewing needles armed with one thread of sterilized catgut through the wall of the upper end of the ureter one-eighth of an inch from the extremity, from within outward, the needles being from one-sixteenth to one-eighth of an inch apart, and equidistant from the end of the duct. It will be seen that the loop of the catgut between the needles firmly grasps the upper end of the ureter.



The needles have been introduced into the wall of the renal portion of the ureter. The end of the vesical portion of the tube has been ligated, and a slit made in its walls.



The needles carrying the traction suture attached to the renal portion of the ureter have been passed into the slit in the wall of the vesical portion, carried down a short distance, and pushed out through the wall.



By means of the traction suture the renal portion of the ureter has been implanted into the vesical portion. The ends of the traction suture have been tied together.

4. These needles are now carried through the slit in the side of the lower end of the ureter into and down the tube for one-half an inch, where they are pushed through the wall of the duct side by side.

5. It will now be seen that the traction upon this catgut loop passing through the wall of the ureter will draw the upper fragment of the duct into the lower portion. This being done, the ends of the loop are tied together securely, and as the catgut will be absorbed in a few days, calculi do not form to obstruct the passage of the urine.

6. The ureter is now enveloped carefully with peritoneum, as already described in other operations, provided an intra-peritoneal operation has been done.

KELLEY, HOWARD.—Uretero-cystostomy performed seven weeks after vaginal hysterectomy. *Bulletin Johns Hopkins Hospital.* Vol. 4, No. 47.

She entered the Hospital in August, 1894, with an extensive carcinoma of the cervix, for which, Dr. Russell, resident gynecologist, performed vaginal hysterectomy. The disease had extended so far out into the broad ligaments that he was obliged to place the ligatures at a greater distance from the cervix than usual. She recovered rapidly from the hysterectomy, but retained as a sequel a ureteral fistula in the vault of the vagina near the middle of the cicatrix. From this there was the usual constant leakage of urine, although she regularly passed the urine accumulating in the bladder from the other kidney. From a simple vaginal inspection it was impossible to say whether the flow from the cicatrix came from the right side or the left. It clearly did not come from the bladder, for it remained unchanged by the injection of a sterilized solution of milk into that viscus.

To decide which was the severed ureter I placed the patient in the knee-breast position and introduced my No. 10 cystoscope, when the bladder filled with air and I was able to inspect the ureteral orifices. By introducing a searcher into the left ureteral orifice I found that this ureter was intact as far as the posterior wall of the pelvis. Upon introducing the searcher into the right ureteral orifice it could not be carried in more than two centimeters, on account of meeting an impassible obstruction. The urine was seen flowing from the left ureteral orifice while nothing escaped from the right side. The demonstration was thus complete that it was the right ureter which was injured and the left was intact.

Having cleared up the diagnosis in this way I proceeded to operate to relieve the condition, October, 1894, seven weeks after the original operation by Dr. Russell.

Operation: The patient was placed in the Trendelenberg position and an incision 12 cm. long made through abdominal walls loaded with fat. Every step throughout the operation was embarrassed by the obesity of the patient. After opening the abdomen, the large fat omentum and intestines were dislodged

from the lower abdomen and pelvis with great difficulty, and held away by means of cotton gauze pads.

The end of the ureter could not be found on the pelvic floor on account of the rigidity and inflammation surrounding the line of scar tissue between the rectum and bladder. The right ovary and tube were also pinned down to this scar tissue by numerous vascular adhesions. The attempt to reach the ureter at this point was therefore abandoned and it was sought out at the pelvic brim, where it was readily found, after lifting up the caput coli and incising the peritoneum and pushing aside the fat. It was then traced from the point of crossing the common iliac artery down to the pelvic floor, exposing the whole length of the pelvic portion by splitting the peritoneum over its upper surface. The anterior portion of the ureter was involved in the inflammatory material surrounding the scar, which bled so freely that no attempt was made to dissect it out. Four centimeters of the length of the ureter lying directly posterior to the scar tissue were dissected out and the ureter lifted up from its bed and divided close to the scar, sacrificing as little as possible of its length.

I now found that although I had cut the ureter to the best advantage, I could not do more than merely bring it into contact with the bladder by pulling on it. It was of course evident that if I were to suture it to the bladder, exercising this degree of traction, it would pull out soon after the operation and I would have a uretero-abdominal instead of a uretero-vaginal fistula to deal with.

I was able to cope successfully with this formidable difficulty in the following manner: The bladder was dissected free from its attachments to the horizontal rami of the pubis on both sides, with scissors and fingers, and dropped down into the pelvis so as to extend it and carry it more into the back part of the pelvis, gaining at least 3 cm. in this way. By this means the ureter and the bladder were easily approximated without strain. I then made a small incision through the bladder wall, covered with fat at least a centimeter thick, at the point on the right nearest the ureteral end drawn straight across the pelvis. This incision passed through the peritoneum and was not more than 3 or

4 mm. in length and just large enough to receive the ureter snugly.

I then slit up the under surface of the ureter for about 4 mm. enlarging the caliber of its orifice to avoid a stricture, and with a pair of long delicate forceps introduced through the urethra, the bladder, and through the incision, I caught the ureteral end and drew it into the bladder and held it there while it was being

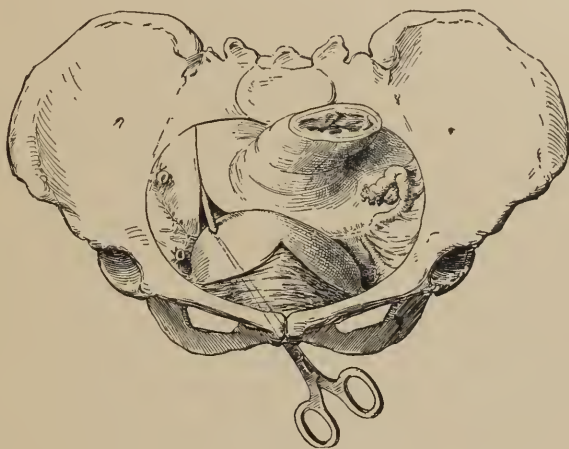


FIG. 1.

FIG. 1.—THE FIELD OF OPERATION THROUGH THE SUPERIOR STRAIT. The bladder is freed from its connections above and dislocated downward, and on the right side backward to meet the short ureter. Its superior surface is seen uncovered by peritoneum. The angle in the middle is the lower terminus of the abdominal incision; the extent of the displacement of the bladder can be estimated by this. Forceps hold the ureter in place until the sutures are passed. A part of the ureter is seen lifted up free from the pelvic floor.

attached to the bladder wall by about six fine interrupted silk sutures passed through the muscular tissue of the bladder and peritoneal and muscular coats of the ureter on all sides, beginning with the under side.

The ureter thus dissected out of its bed, and attached to the bladder, was stretched like a lax cord from the posterior part of the pelvis to the bladder, which lay gibbous and flattened out on the pelvic floor.

The abdominal incision was closed down to its lower angle, where a narrow gauze drain was inserted for fear of leakage. Care was taken in closing the incision not to draw together the

peritoneum underlying its lower end, to avoid raising the bladder and indirectly pulling upon the ureter.

No leakage occurred and the drain was removed, and the wound healed without suppuration. Her urinary difficulties were immediately and completely relieved with the perfect restoration of continence.

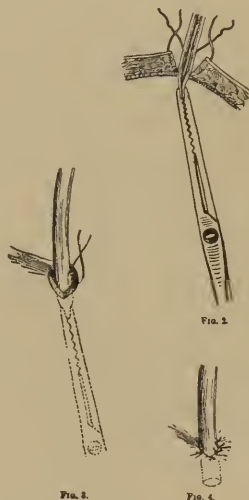


FIG. 2.—Schematic section showing the way the ureter was held by forceps and the relation of the sutures to the coats of the bladder and the ureter. All but the mucous coats of both were included.

FIG. 3.—The appearance of the ureter entering the opening in the bladder. One suture laid in place, but not tied.

FIG. 4.—Shows the snug union of ureter to bladder after both deep and superficial sutures were applied.

At a subsequent cystoscopic examination I discovered the abnormally placed ureteral orifice opening into the posterior hemisphere of the bladder into which it freely discharged its urine.

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